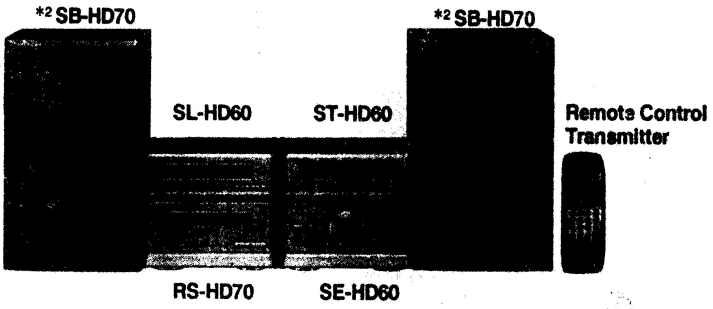
ORDER NO. AD9702016C2

Service Manual

Tuner

Tuner

System: SC-HD60

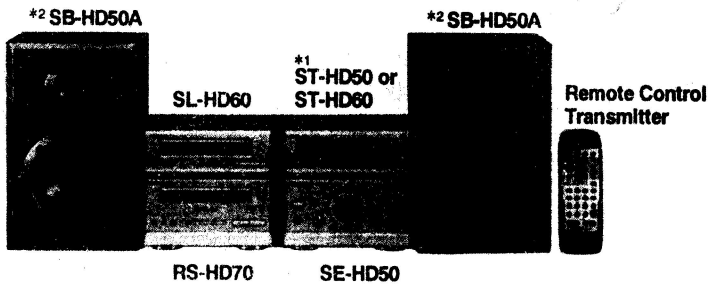


ST-HD60

Colour
(N) ..... Gold

Areas
(E)/(EP) ..... Europe, Russia

System: SC-HD50*1



Because of unique interconnecting cables, when a compact requires service, send or bring in the entire system.

*1

System	Areas	Tuner
SC-HD50	(Germany. Italy.)	: ST-HD60
SC-HD50	(Europe. Russia.)	: ST-HD50

Specifications

Pre-amplifier Section
Input sensitivity/impedance
EXTERNAL: 250 mV/15 kohm
Output level
EXTERNAL: 250 mV/1.5 kohm
Frequency response
EXTERNAL: 50 Hz – 25 kHz
S/N
EXTERNAL: DIN 82 dB (83 dB, IHF)

FM tuner Section
Frequency range: 87.50 – 108.00 MHz (0.05 MHz steps)
Sensitivity: 1.8 μV (IHF usable)
S/N 26 dB: 1.5 μV
S/N
MONO: 70dB (75 dB, IHF)
Stereo separation
1 kHz: 35 dB
Antenna terminal(s): 75 ohm (unbalanced)

AM tuner Section
Frequency range: 522 – 1611 kHz (9 kHz steps)
530 – 1620 kHz (10 kHz steps)
Sensitivity (S/N 20 dB): 500 μV/m
MAIN: 80 dB

Timer Section
Clock: Quartz-lock type
Function: 24-hour programmable;
Play timer (1 time), Rec timer (1 time)
Sleep (120 min., 30 min., intervals)
Setting: 1 minute – 23 hours 59 minutes (1 min. intervals)

General
Dimensions: 196(W)/67(H)/235(D) mm
Weight: 1.2 kg

Notes:
Specifications are subject to change without notice.
Weight and dimensions are approximate.

System/SC-HD60:
Tuner: ST-HD60, Compact Disc Player: SL-HD60, Amplifier: SE-HD60, Cassette Deck: RS-HD70, Speakers: SB-HD70

System/SC-HD50:
Tuner: ST-HD50 or **ST-HD60**, Compact Disc Player: SL-HD60, Amplifier: SE-HD50, Cassette Deck: RS-HD70, Speakers: SB-HD50A

Notes: *2 ..... Made in PAES

⚠WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Technics®

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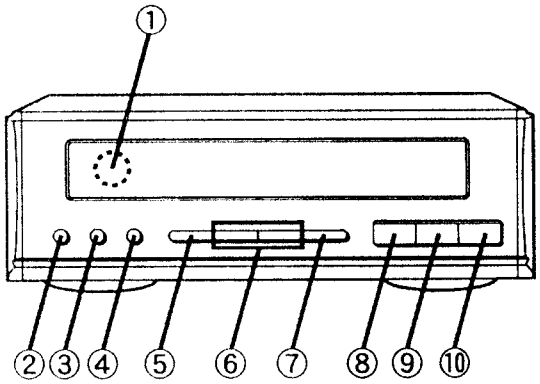
■ Contents

	Page
Location of Controls	2
Setting the Time	2
About the Self-Diagnostic Mode	3
Operation Checks and Main Component Replacement Procedures	4,5
Type Illustration of ICs, Transistors and Diodes	6
To Supply Power Source	6
Schematic Diagram	7 ~ 15
Printed Circuit Board Diagram	16 ~ 18
Wiring Connection Diagram	19
Terminal Function of IC's	20,21
Block Diagram	22 ~ 25
Replacement Parts List (Electrical)	26, 27
Resistors and Capacitors	28, 29
Replacement Parts List (Cabinet)	30
Cabinet Parts Location	31

NOTE:
Refer to the service manual for Model No. SE-HD60 (ORDER No. AD9702022C2) and Model No. SE-HD50 (ORDER No. AD9702017C2) for information on "Accessories", "Installation", "Connections" and "Packaging".

■ Location of Controls



① **Remote control signal sensor (SENSOR)**
② **Record timer button (◴ REC)**
③ **Play timer button (◴ PLAY)**
④ **Clock/timer buttons (CLOCK/TIMER)**
⑤ **Set button (SET)**
⑥ **Tuning/time adjust button (∨ , ∧ TUNING/TIME ADJUST)**
⑦ **Tuning mode select button (TUNING MODE)**
⑧ **Source input select button (INPUT SELECTOR)**
⑨ **RDS display mode select button (RDS DISPLAY MODE)**
⑩ **Band select button (FM/AM)**

■ Setting the Time

The tuner display the time, frequency and other information on CDs and tapes.

This is a 24-hour display clock.

These instructions explain how to set the timer for 16:25 on Wednesday.

1 Switch on the power.

2 (1) **Press CLOCK/TIMER to show "CLOCK".**

Every time you press the button, the indication changes in the order of CLOCK → ◴ REC → ◴ PLAY → Original display.

Within 8 seconds:

(2) **Press SET.**

3 (1) **Press ∨ or ∧ to select the day.**

Every time you press one of the button, the indication changes in the order of SUN ⇄ MON ⇄ TUE ⇄ WED ⇄ THU ⇄ FRI ⇄ SAT.

(2) **Press SET.**

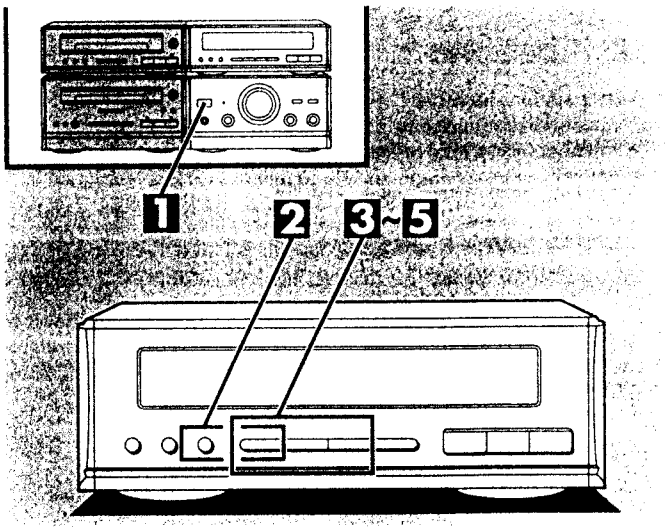
4 (1) **Press ∨ or ∧ to select the hour.**

(2) **Press SET.**

5 (1) **Press ∨ or ∧ to select the minutes.**

(2) **Press SET to finish setting the time.**

The display will return to the previous display after about 3 seconds.



When " - - : - - " appears:
If flashes when you connect the AC power supply cord for the first time or if there has been a power failure.
Reset the time as explained above.

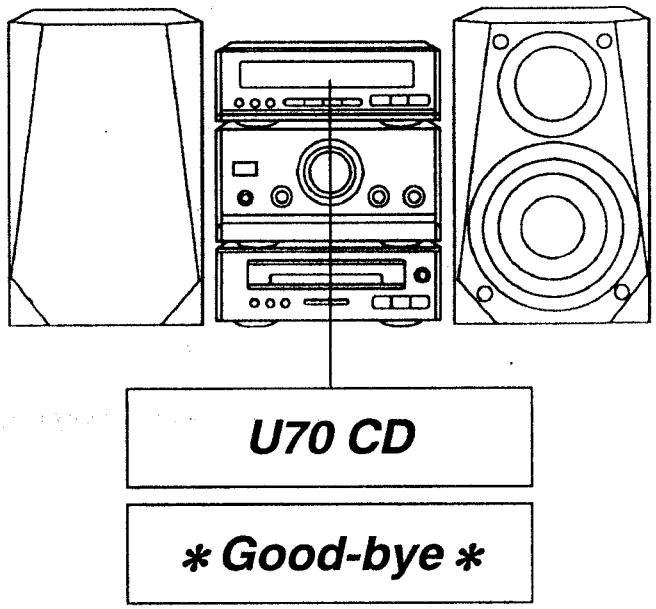
If the minutes setting is off:
1. Press CLOCK/TIMER.
2. Press SET 3 times.
3. Press ∨ or ∧ to set the minutes, and then press SET.

To display the clock again:
Press CLOCK/TIMER.
The clock display will appear for about 8 seconds.

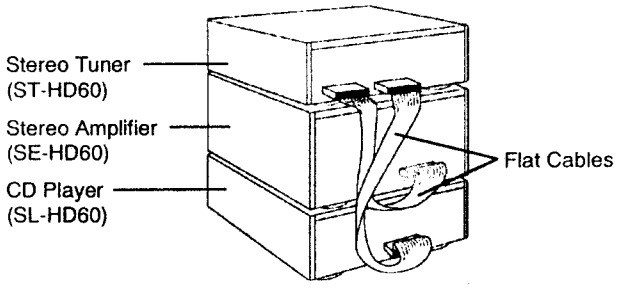
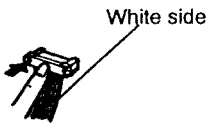
For your reference:
When you turn OFF the system from the POWER button, the system goes on standby and the STANDBY indicator lights up.

■About the Self-Diagnostic Mode

This unit is equipped with a self-diagnostic function which, in the event of a malfunction, automatically displays a code indicating the nature of the malfunction. Use this self-diagnostic function when servicing the unit.

Display method	Display location
To display the malfunction code U70 CD ..... Automatically displays on the stereo tuner processor when a malfunction occurs. ＊Good-bye＊ ..... Automatically displays on the stereo tuner processor when a malfunction occurs. **To return to the normal display** 1. For U70 CD: ● Press an any operation button on the stereo tuner. ● To re-display the code, switch the power off (POWER STANDBY button), and then switch power back on again. 2. For ＊Good-bye＊: ● If "＊Good-bye＊" is displayed, the power will automatically be switched off and the standby indicator will light up. ● "＊Good-bye＊" will be displayed for 3 seconds, and then the clock will be displayed. ● To re-display the code, switch the power on. "＊Good-bye＊" will be re-displayed, and then after 3 seconds the clock will be displayed and the power will automatically switch off.	

Display contents

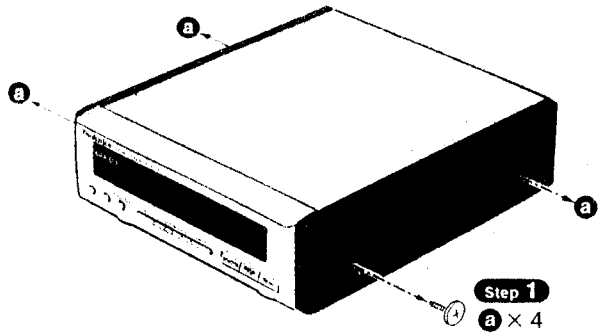
Display code	Problem or condition	Correction procedure
U70 CD (displayed automatically)	A bus-line communications error has occurred as a result of the flat cables being inserted incorrectly, thus preventing the system from operating. 1.If "U70 CD" is displayed on the stereo tuner, the CD Player cannot be operated by remote control.	 1. To check for correct insertion of the flat cables. ①Insert each connector until you hear a click. ②Insert the flat cables at the back of the unit in the order indicated. Make sure the white side of the cable is on your right side.  2. Breakage of flat cable. (Check and replace as necessary.) 3. If the problem is not corrected by items (1.) and (2.) above, this indicates a faulty IC. **ST-HD60:** IC901 (M38197MA146F) **SL-HD60:** IC403 (LC66356B4H02) Check these IC's and replace as necessary.
＊Good-bye＊	When the power switch is switched on, it automatically switches back off, making it impossible to switch power on.	● Faulty Stereo Tuner (ST-HD60) output IC (IC501). (When a DC voltage is applied to the speaker terminals.)

■ Operation Checks and Main Component Replacement Procedures

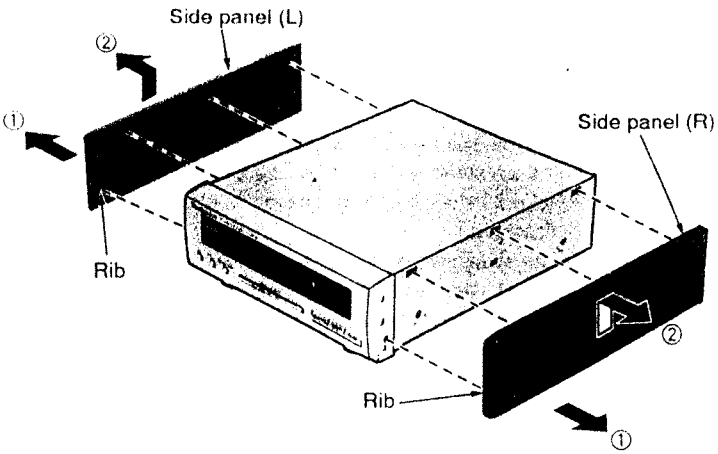
NOTE 1. This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.

2. For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.

1. Checking for the RDS P.C.B., tuner P.C.B. and FL P.C.B.



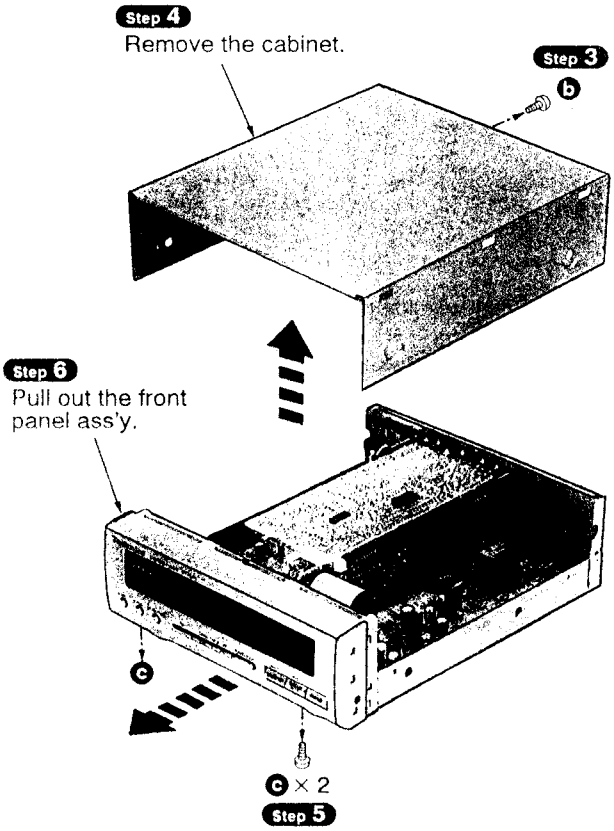
Step 2
Remove the side panel (L),(R).
• Spread the lower part of the side panels in the direction of arrow (➡①) to release the ribs, and then lift to remove the side panels (➡②).



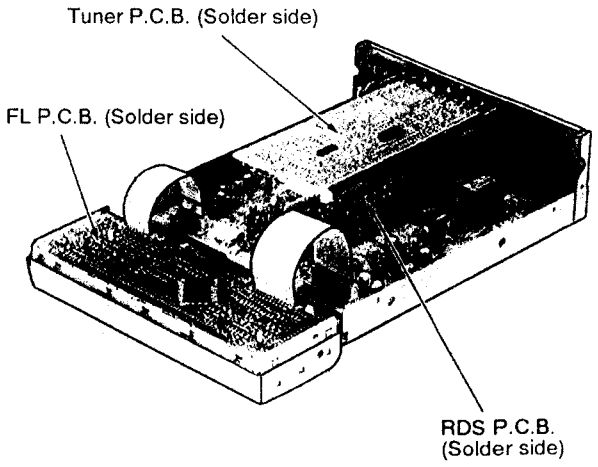
Step 4
Remove the cabinet.

Step 3
b

Step 6
Pull out the front panel ass'y.



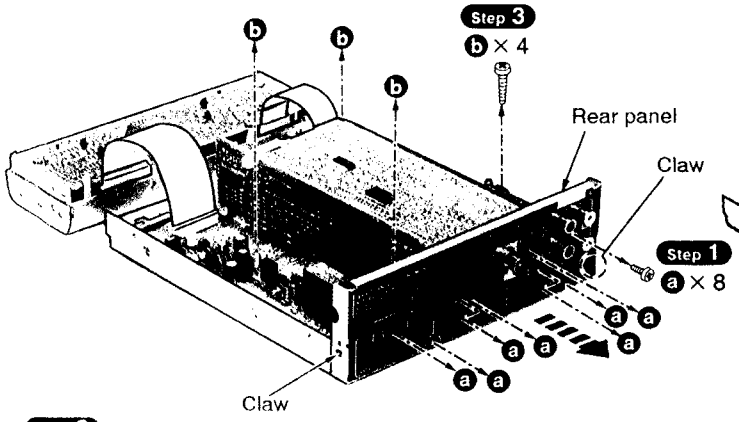
• **Check the RDS P.C.B., tuner P.C.B. and FL P.C.B. as shown below.**



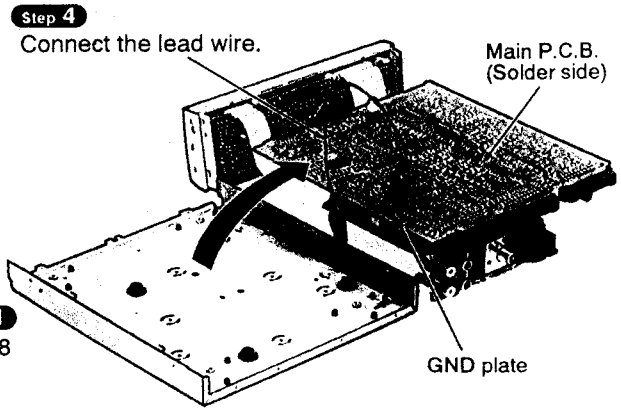
2. Checking for the main P.C.B.

• Follow Step 1 ~ Step 6 in item 1 on page 4.

• Check the main P.C.B. as shown below.



Step 2
Release the 2 claws, and then remove the rear panel.



■ Type Illustration of ICs, Transistors and Diodes

LA1832MH-TEL 24PIN LC7218M-TE-L 24PIN NJU7313AMT2 30PIN LC65104A4F75 30PIN M62425FPE1 36PIN	M5218AFPE3 M5219FPTA	M38197MA146F	STK311-010	2SB621AQRSTA	
2SC3940AQSTA		2SA1309AQSTA 2SC2785FETA 2SC2787LTA 2SC3311AQSTA 2SC3311ARSTA UN411FTA UN4111AITA UN4115TA UN4211AITA	UN4214AITA	2SB1417PQTA 2SD2137PQTA	2SD2144STA DTC143XSTP
MA4150MTA MA4300MTA	MA185TA		MA4039MTA MA4051MTA MA4062HTA MA4082LTA		1SS291TA MA165TA MA723TA
MA719TA	RL1N4003N02				

■ To Supply Power Source

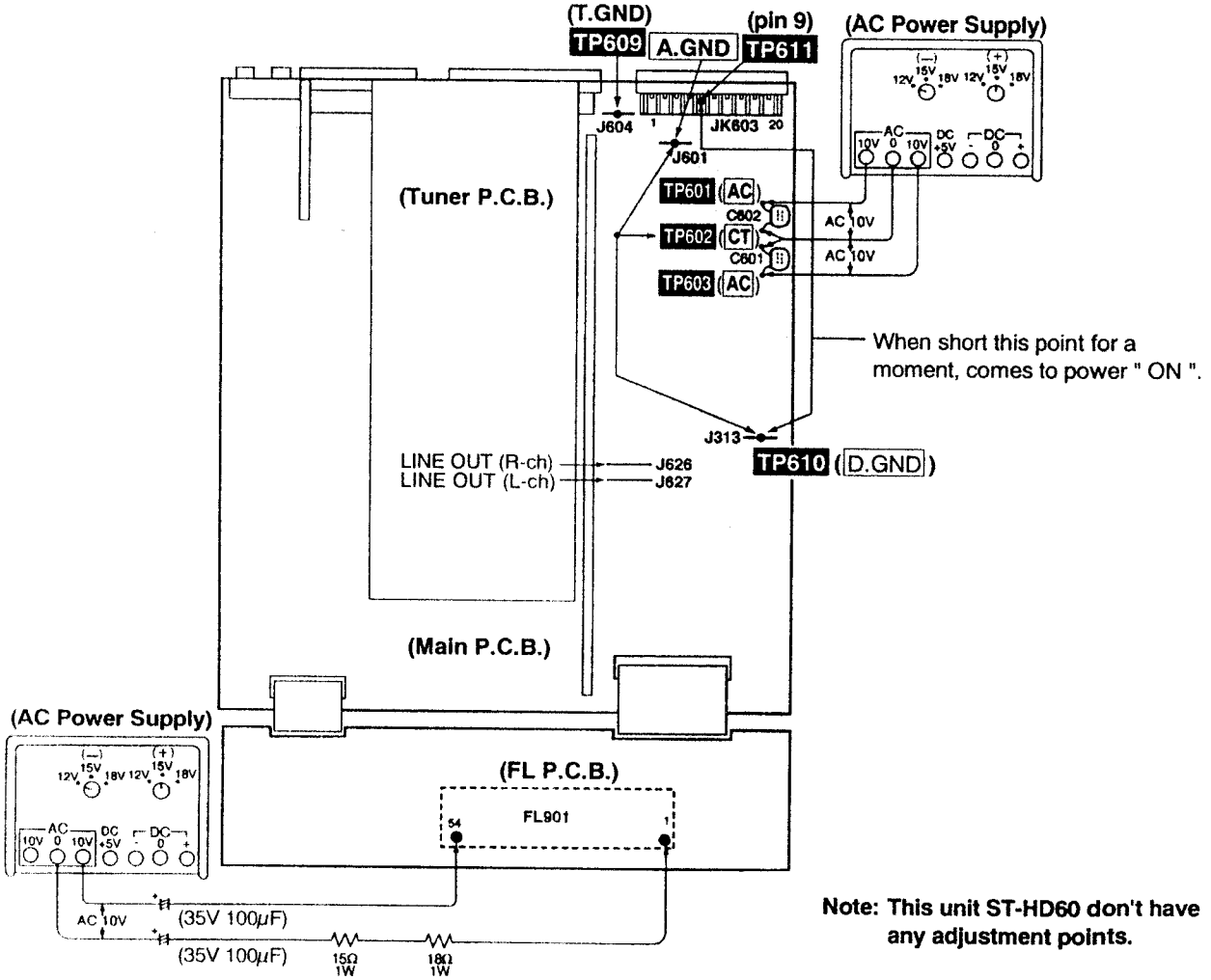
This unit ST-HD50 is designed to operate on power supplied from the Amplifier SE-HD50. When operating the unit ST-HD50 alone for testing and servicing, without having power supplied from the Amplifier SE-HD50, use the following method.

Power Supply to Main Circuit

1. Short the section between the test points **TP602** ([CT]) and **TP610** ([D.GND]), and as well as the section between the test points [A. GND] (J601) and **TP610** ([D.GND]).
2. Connect the 10 V AC power through the capacitor (35V 100μF) to pin 1 of the indicator module FL901 and the GND terminal through the capacitor (35V 100μF) to pin 57 of the same FL901 module.
3. Apply 10 V AC power to the section between the point **TP601** ([AC]) and the point **TP602** ([CT]) as well as the section between the point **TP603** ([AC]) and the point **TP602** ([CT]). This unit comes to stand-by mode.
4. Short the section between the jumper **TP611** (JK603-pin 9) and the point **TP610** ([D.GND]) for a moment. The main circuit comes to power ON mode. (Whenever this operation is performed, power, ON/OFF mode is repeated.)

To Check Signals

Connect the oscilloscope or the speaker with the built-in amplifier to the section between the point J626 [LINE OUT (R-ch)] and the point **TP610** ([D.GND]) as well as the section between the point J627 [LINE OUT (L-ch)] and the point **TP610** ([D.GND]) as shown in Fig. 1, and check if the signals are outputting from this unit.



Note: This unit ST-HD60 don't have any adjustment points.

Fig. 1

■ Schematic Diagram

Page

A TUNER CIRCUIT 8, 9
B RDS CIRCUIT 10
C INPUT/OUTPUT CIRCUIT 11
D MAIN CIRCUIT ..... 11 ~ 13
E FL CIRCUIT 14, 15
F OPERATION CIRCUIT 15

- **This schematic diagram may be modified at any time with the development of new technology.**

Notes:

- S901 : Record timer switch (⏲ REC)
- S902 : Play timer switch (⏲ PLAY)
- S903 : Clock/Timer switch (CLOCK/TIMER)
- S904 : Set switch (SET)
- S905,906 : Tuning/Time adjust switch (TUNING/TIME ADJUST)
  (S905: DOWN, S906: UP)
- S907 : Tuning mode select switch (TUNING)
- S908 : Source input select switch (INPUT SELECTOR)
- S909 : RDS Display mode switch (RDS DISPLAY MODE)
- S910 : FM/AM switch (FM/AM)

- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
  No mark: Power ON

- Voltage values and waveform are measured as indicated in the schematic diagram when test points between **TP602** and **TP610**, and between **TP610** and **A.GND**, and between **TP609** and **A.GND** are shoted.
  No mark: FM MODE ( ): AM MODE

- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety.
  Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

- **Caution!**
  IC and LSI are sensitive to static electricity.
  Secondary trouble can be prevented by taking care during repair.
  Cover the parts boxes made of plastics with aluminum foil.
  Ground the soldering iron.
  Put a conductive mat on the work table.
  Do not touch the legs of IC or LSI with the fingers directly.

- **Voltage and signal line**

: Positive voltage line : AM signal line : AM OSC signal line : REC OUT signal line
: Negative voltage line : FM signal line : AM OSC signal line

ST-HD60

: Positive voltage line : AM signal line : AM OSC signal line : FM signal line : AM OSC signal line

A TUNER CIRCUIT (P.C.Board:on page 16)

Z120 FM FRONT END(RAL0019)

2SK238 RF AMP

2SC2620 FM MIXER

2SK360 FM OSC

2SC2996 BUFFER AMP

2SC2996 BUFFER AMP

JK101 FM ANT (75 Ω)

FM SIGNAL

AM SIGNAL

AM ANT EXT LOOP

L191 0.68μH

L101 0.68μH

AM OSC SIGNAL

FM OSC SIGNAL

Z101

AM ANT

AM OSC

R110 1K

L103 0.47μH

L104 1μH

R176 390

R103 100

R128 82

R138 10K

R113 10K

R114 5.6K

C111 25V4.7

R115 560

Q103

Q104

0.6V

C112 0.01

C110 0.01

D101 MA4051MTA

C134 27P

C133 27P

X103 (7.2MHz)

FM/AM F=7.2MHz 3.8V P-P

R116 1K

C132 1000P

C130 6.3V100

R117 82K

R129 47K

R130 10K

C145 22P

C124 1000P

C113 1000P

X OUT Vss PD2 PD1 VDD FM IN AM IN MONO HCTR LCTR FM (LW)

FM/AM F=7.2MHz 2.6V P-P

IC102 LC7218M-TE-L PLL FREQUENCY SYNTHESIZER

X IN CE DI CL DO SYC IN0 IN1 AM NC STRQ MUTE

R137 1K R136 1K R135 1K R134 1K

R133 1K R132 10K D102 MA165TA R127 10K

Q103,104 2SC2785FETA FM/AM LOOP FILTER

V (FM) 10.6V 2.1V 87.5MHz ↔ 108MHz F

V (AM) 6.8V 1.1V 522kHz ↔ 1629kHz F

R104 10K C103 0.01

R109 330

R106 470K R107 330 C105 1000P R108 470K

CF201 CF202

C104 1000P

R105 470

Q101 Q102

Q101,102 2SC2787LTA FM IF AMP

FM+B LINE

Q110 2SC3311ARSTA BUFFER AMP

R563 3.3K R121 3.3K L151 C181 470P R177 4.7K

Q106 UN4111AITA POWER SUPPLY (FM:ON)

14.3V (0V) 14.4V 6.7V (14.4V)

Q107,108 2SC3311ARSTA BUFFER AMP

IC101 LA1832MH-TEL FM/AM IF AMP,DET/AM OSC,MIX/FM MPX

FM F=456kHz 4.2V P-P

R118 4.7K C114 50V3.3 R120 47K C115 25V4.7 C116 8200P C117 390P X101 (456kHz) C120 50V1 C118 0.01 C143 50V1 C144 50V1

AM OSC AM MIX AM RF AMP VCO DECODER FREQUENCY DIVIDER STEREO SWITCH FM/AM IF AMP DET PHASE DET

R147 470K R143 2.2K C141 50V1 R171 1K R139 2.7K R141 1K C135 0.01 L105 8.2mH C137 560P R145 820 C139 6800P Q107

R148 470K R144 2.2K C142 50V1 R172 1K R140 2.7K R142 1K C136 0.01 L106 8.2mH C138 560P R146 820 C140 6800P Q108

R119 10K C127 16V22 C126 0.047 C106 0.01 C125 15P R124 270 X102 (10.6MHz) R173 470 C122 50V2.2 C121 50V1 R122 2.7K C123 50V1

Z102

C128 1000P C129 6.3V100 C148 0.01 R126 1.5K R125 1.5K C196 1000P R175 1K R149 68 C149 0.1

FM F=10.6MHz 0.18V P-P

7.2V 14.4V

CN101B CN102B

B RDS CIRCUIT (P.C.Board:on page 16)

: Positive voltage line
: AM signal line
: FM signal line

IC551
STK311-010
RDS DECODER

Q553
UN4211AITA
SWITCHING

Terminal guide:
on page 21

IC552
LC65104A4F75
MICRO COMPUTER

Q550
UN4211AITA
RESET

Q551
UN4211AITA
P.SUPPLY
CONT.

Q552
UN411FTA
POWER SUPPLY

To D MAIN CIRCUIT (CN502A) on page 11
To D MAIN CIRCUIT (CN103A) on page 11
To D MAIN CIRCUIT (CN104A) on page 11

C INPUT/OUTPUT CIRCUIT (P.C.Board:on page 16)

: Positive voltage line
: Negative voltage line
: AM signal line
: FM signal line
: REC OUT signal line

To B RDS CIRCUIT (CN103B) on page 10
To B RDS CIRCUIT (CN104B) on page 10
To B RDS CIRCUIT (CN502B) on page 10

D MAIN CIRCUIT (P.C.Board:on page 17)

IC203
M5219FPTA
BUFFER AMP

IC202
NJU7313AMT2
INPUT SELECTOR

REC OUT SIGNAL

Q501,503
2SC3940AQSTA
REGULATOR

Q501
Q503

Q902
DTC143XSTP
INTERFACE

Q903,904
2SC3311AQSTA
INTERFACE

: Positive voltage line : Negative voltage line : AM signal line : FM signal line

D MAIN CIRCUIT (P.C.Board:on page 17)

IC302 M62425FPE1 ELECTRONIC VOLUME

IC204 M5218AFPE3 BUFFER AMP

Q309,310 2SA1309AQSTA POWER SUPPLY

Q310

Q309

Q311,312,317,318 2SC3311AQSTA MUTING

Q316,319 UN4115TA MUTING CONT.

Q316

Q317

Q318

Q319

Q311

Q312

Q601 2SD2137PQTA REGULATOR

Q602 2SB1417PQTA REGULATOR

Q603 2SD2137PQTA REGULATOR

Q604 2SD2144STA RELAY DRIVE

Q606 2SB621AQRSTA REGULATOR

D618-621 RL1N4003N02

POWER SUPPLY POINT

SHORT: POWER"ON"

To RS-HD70 :JK601 on page 7

To SL-HD60 :JK401 on page 18

To SE-HD50 :JK201 on page 13

To SE-HD60 :JK201 on page 17

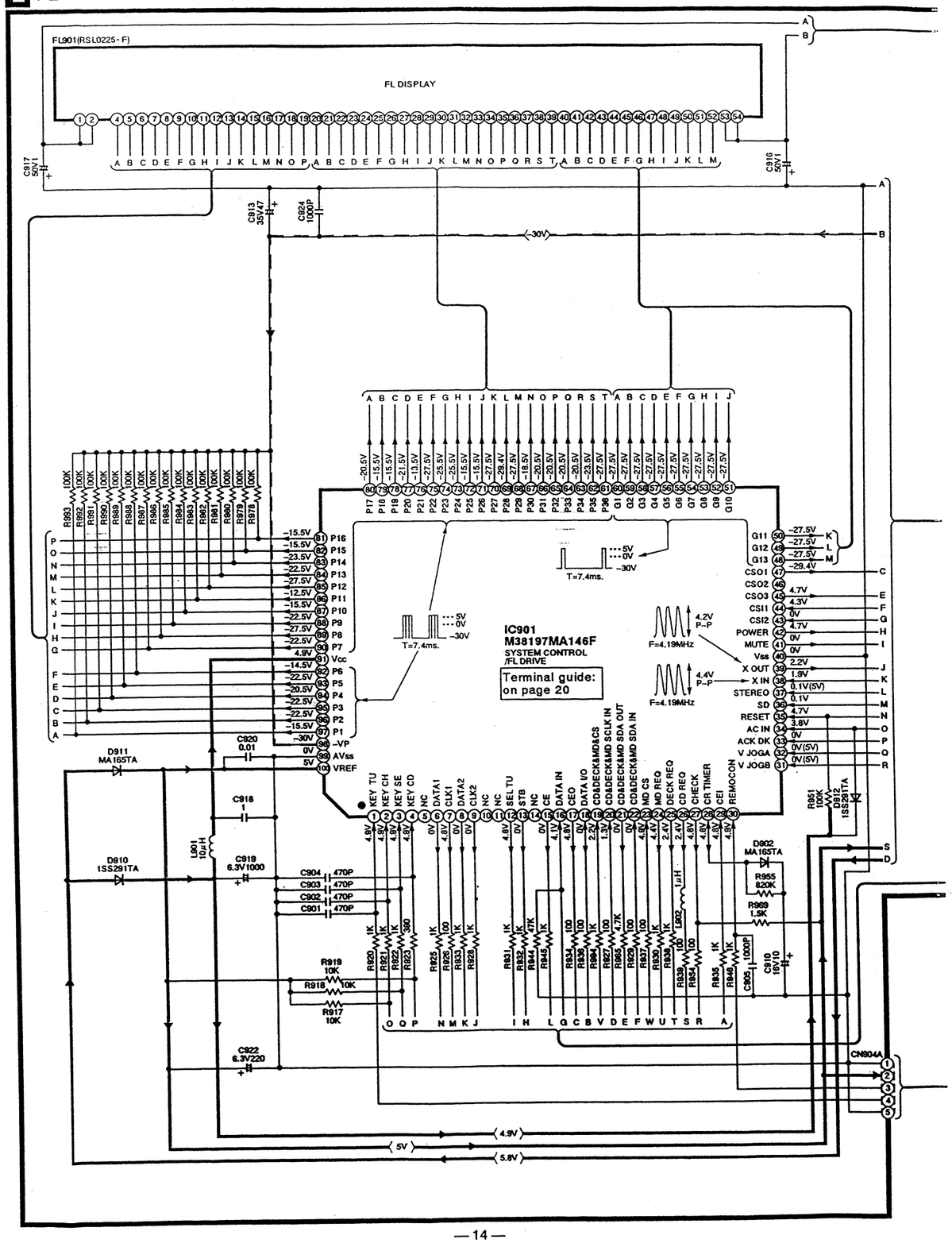
To E FL CIRCUIT(CN902B) on page 15

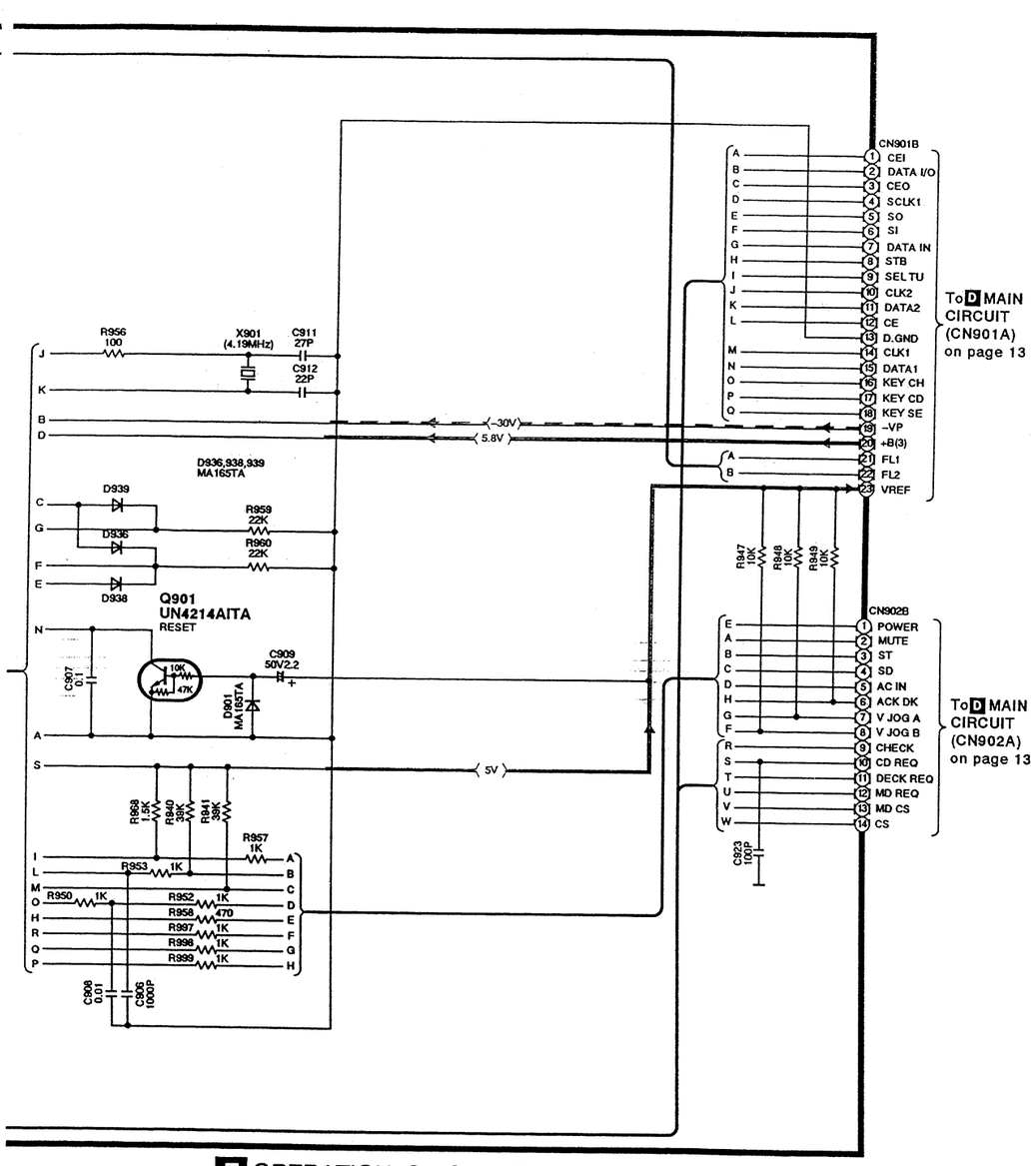
To E FL CIRCUIT(CN901B) on page 15

ST-HD60

: Positive voltage line : Negative voltage line

E FL CIRCUIT (P.C.Board:on page 18)



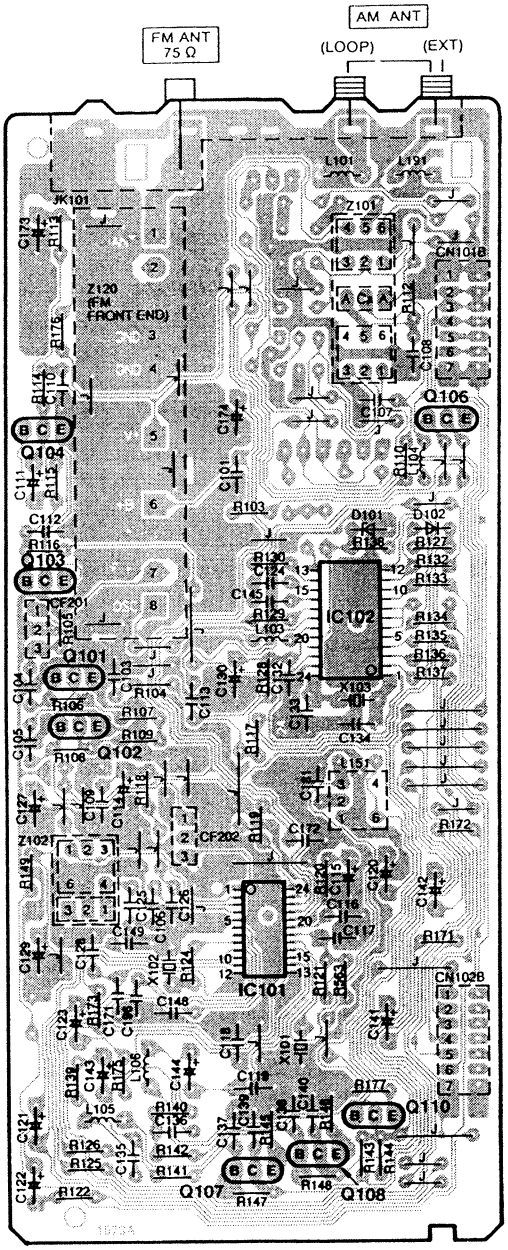


F OPERATION CIRCUIT (P.C.Board:on page 18)

■ Printed Circuit Board Diagram

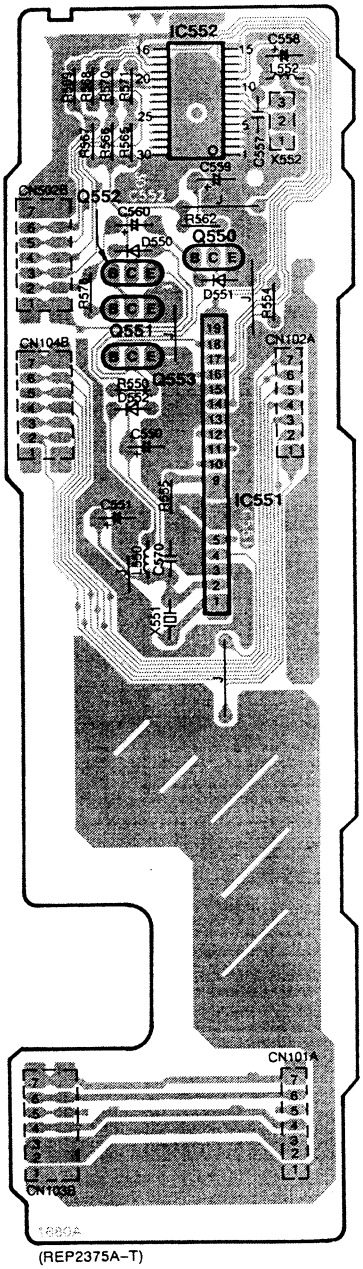
● This circuit board diagram may be modified at any time with the development of new technology.

A TUNER P.C.B.



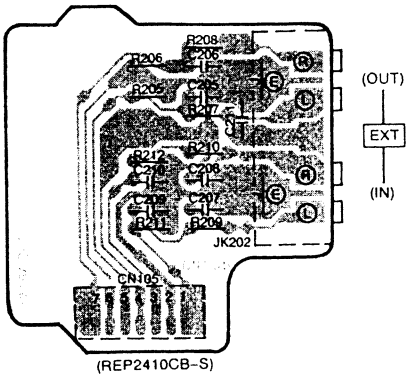
(REP2374A-T)

B RDS P.C.B.

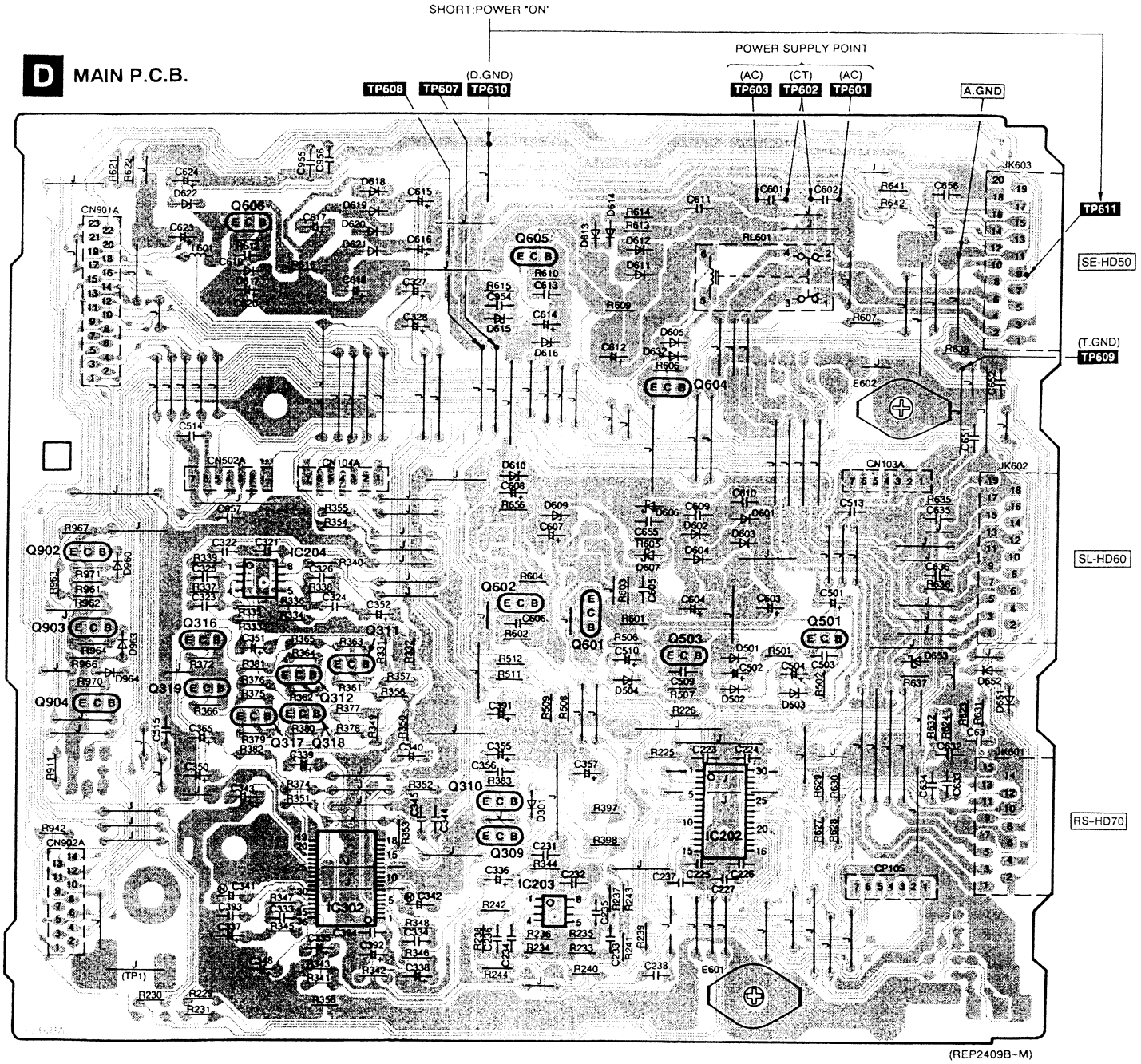


(REP2375A-T)

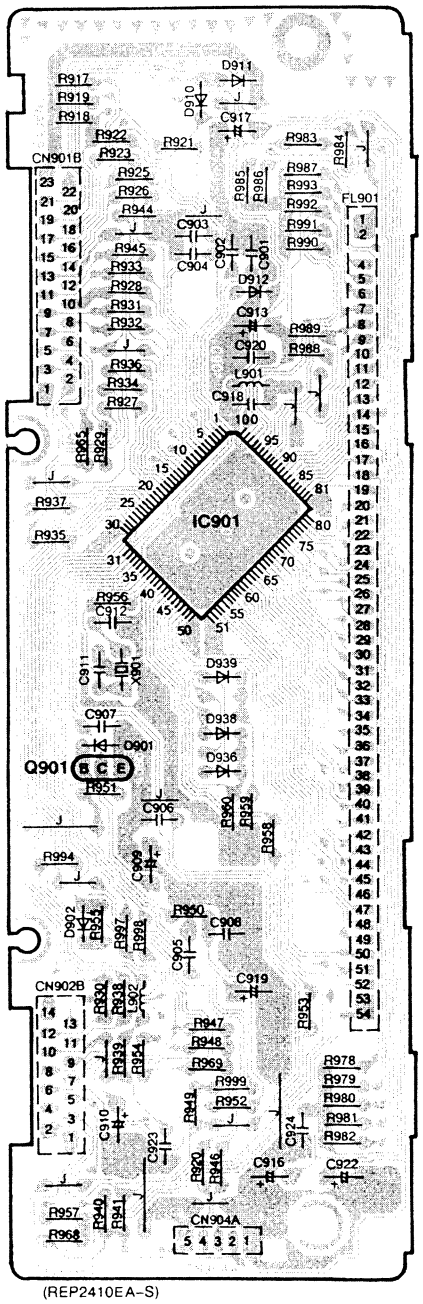
C INPUT/OUTPUT P.C.B.



(REP2410CB-S)

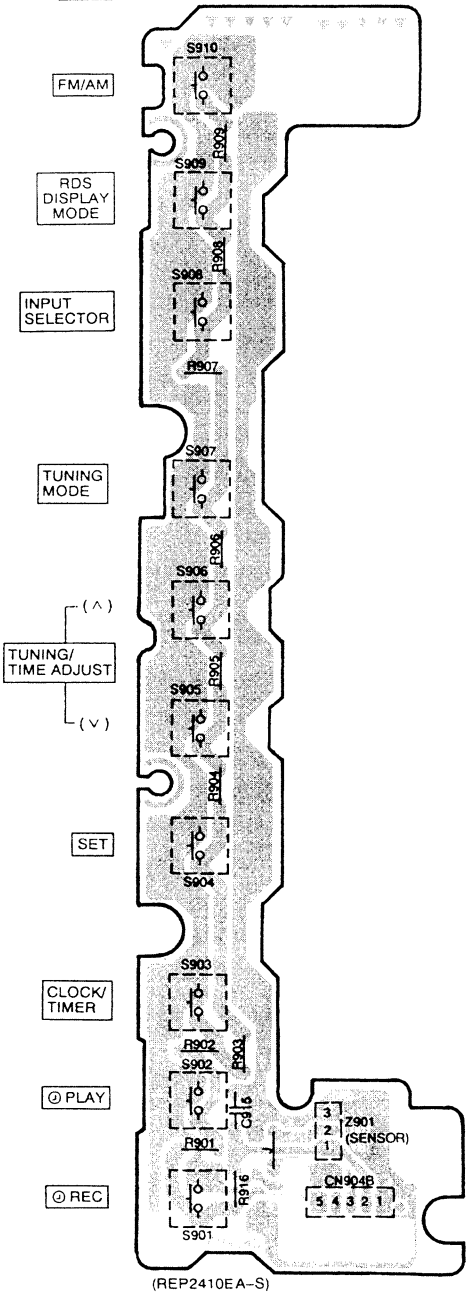

D MAIN P.C.B.
SHORT:POWER "ON"
POWER SUPPLY POINT
(AC) (CT) (AC)
(D.GND)
TP608 TP607 TP610
TP603 TP602 TP601
A.GND
TP611
SE-HD50
(T.GND)
TP609
SL-HD60
RS-HD70
Q606 Q605 Q604 Q902 Q903 Q904 Q316 Q319 Q317-Q318 Q312 Q311 Q310 Q309 Q602 Q601 Q503 Q501
IC204 IC202 IC203 IC302
CN901A CN902A CN502A CN104A CN103A
JK603 JK602 JK601
RL601
E602 E601
(TP1)
(REP2409B-M)

E FL P.C.B.



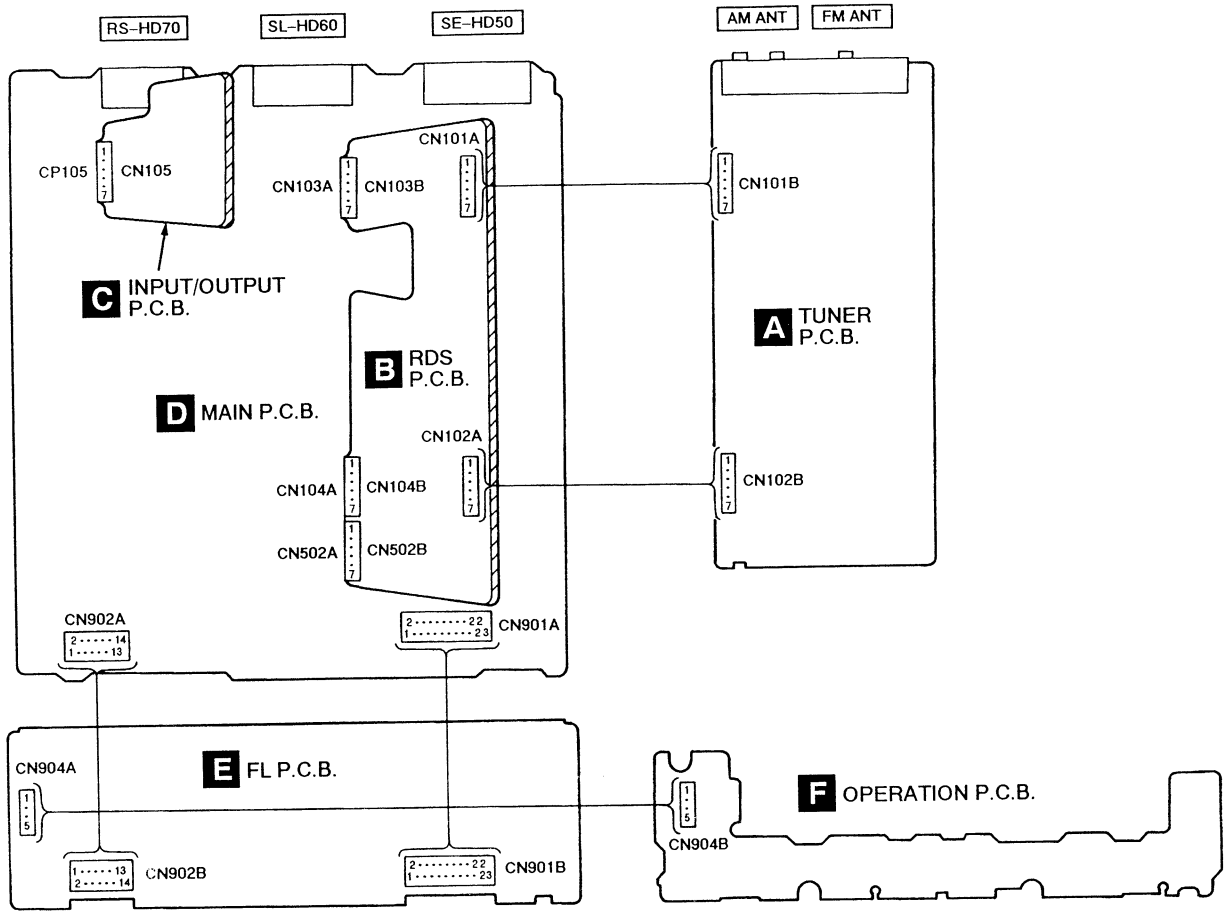
(REP2410EA-S)

F OPERATION P.C.B.



(REP2410EA-S)

■ Wiring Connection Diagram



■ Terminal Function of IC's

● IC901 (M38197MA146F) : SYSTEM CONTROL/FL DRIVE

Pin No.	Terminal Name	I/O	Function
1	KEY-TU	I	Tuner operation switch signal input
2	KEY-CH	I	Input selector operation switch signal input
3	KEY-SE	I	SE-HD60 operation switch signal input
4	KEY-CD	I	SL-HD60 operation switch signal input
5	NC	–	Not used, open
6	DATA 1	O	Serial data output terminal
7	CLK 1	O	Serial clock signal output terminal
8	DATA 2	O	Serial data output terminal
9	CLK 2	O	Serial clock signal output terminal
10,11	NC	–	Not used, open
12	SEL-TU	O	Tuner select signal output
13	STB	O	Strobe signal output
14	NC	–	Not used, open
15	CE	O	Chip enable output
16	DATA IN	I	Serial data input terminal
17	CEO	O	Serial data output terminal for (E,EP) areas
18	DATA I/O	I/O	Serial data input/output terminal for (E,EP) areas
19	CD & DECK & MD CS	I	Serial data input terminal
20	CD & DECK & MD SCLK IN	I	Serial clock signal input terminal
21	CD & DECK & MD SDA OUT	O	Serial data output terminal
22	CD & DECK & MD SDA IN	I	Serial data input terminal
23	MD CS	I	Chip select signal input for MD
24	MD REQ	O	Request signal output for MD
25	DECK REQ	O	Request signal output for RS-HD70
26	CD REQ	O	Request signal output for SL-HD60
27	CHECK	O	Clock check signal output terminal
28	CR TIMER	I/O	Capacitor and resistor oscillation terminal
29	CEI	I	Serial data input terminal for (E,EP) areas
30	REMOCON	I	Remote control signal input
31	V-JOGB	I	Volume control signal input
32	V-JOGA	I	

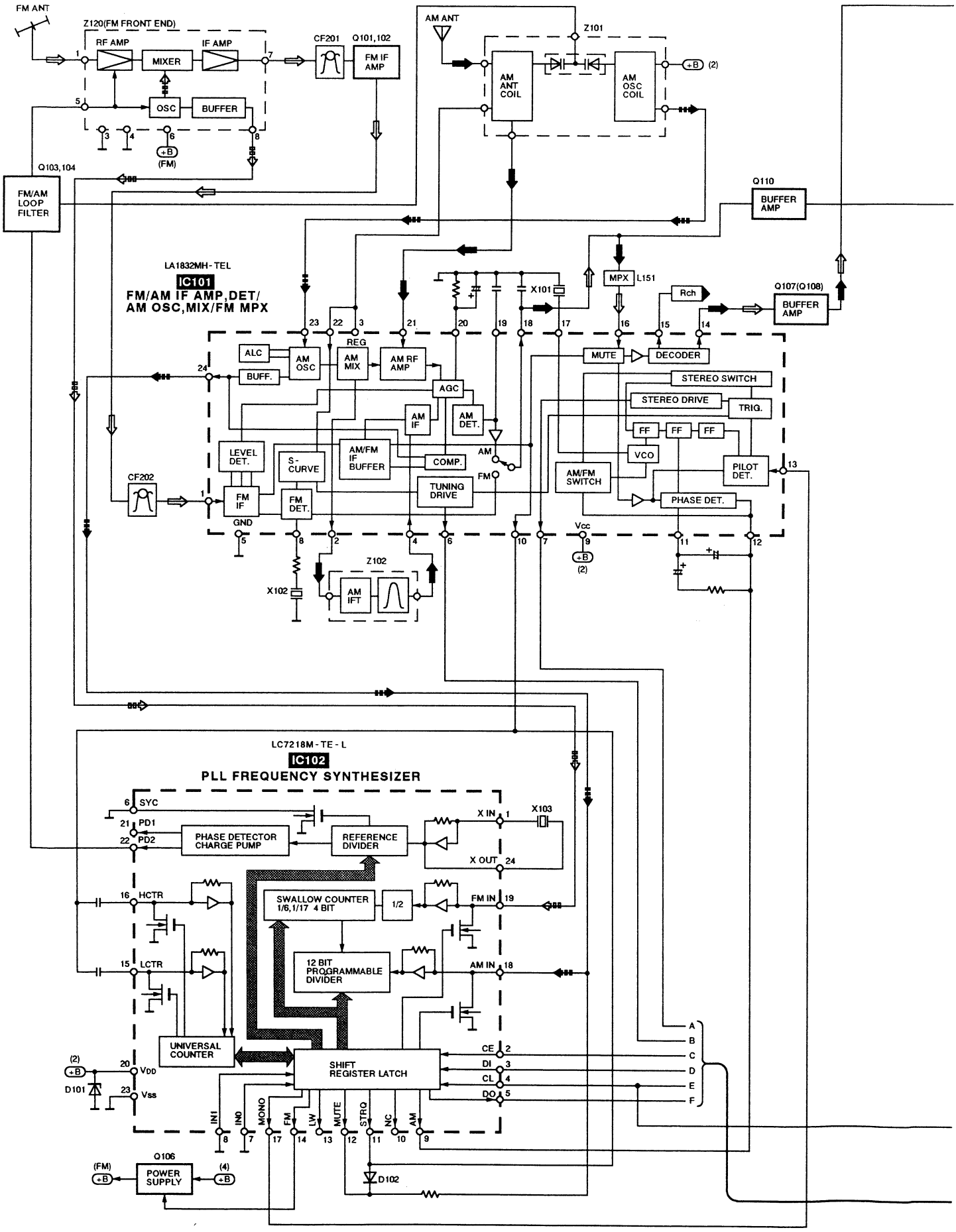
Pin No.	Terminal Name	I/O	Function
33	ACK DK	I	Serial data input for RS-HD70
34	AC IN	I	AC power in detection signal input
35	RESET	I	Reset signal input
36	SD	I	SD control signal input for tuner circuit
37	STEREO	I	STEREO signal input for tuner circuit
38	XIN	I	Connected to the ceramic oscillator
39	XOUT	O	
40	Vss	–	GND terminal
41	MUTE	O	Muting control signal output
42	POWER	O	Power ON/OFF control signal output
43	CSI 2	I	Connect to GND through the resistor
44	CSI 1	I	
45	CSO 3	O	Connect to GND through the diode
46	CSO 2	–	Not used, open
47	CSO 1	O	Connect to GND through the diode
48~60	G13 ~ G1	O	Grid control signal output
61~90	P36 ~ P7	O	Segment control signal output
91	VCC	–	Power supply (+5V)
92~97	P6 ~ P1	O	Segment control signal output
98	-VP	–	Negative power supply
99	AVSS	–	Connected to GND
100	VREF	I	Reference voltage input terminal

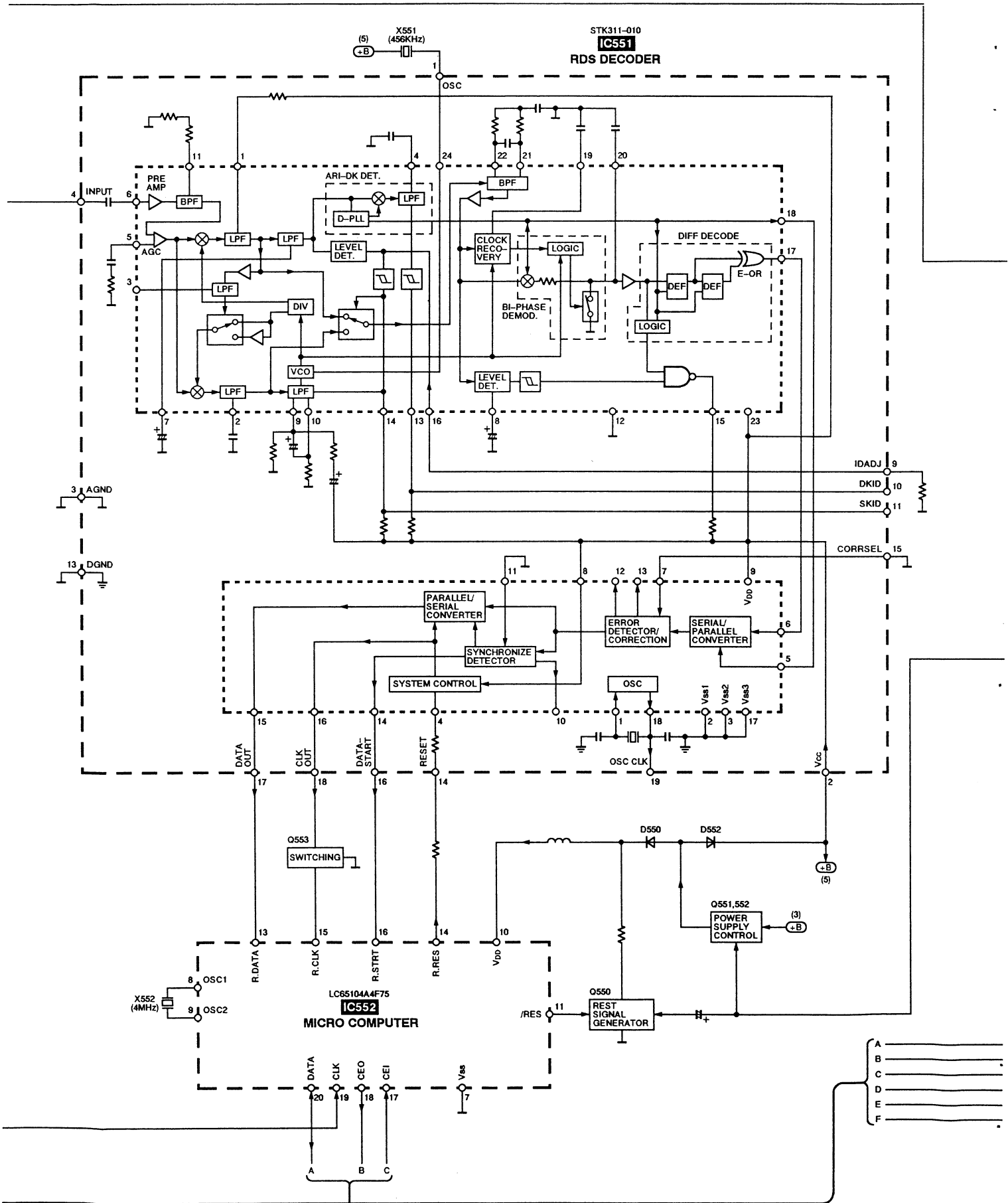
● IC552 (LC65104A4F75) : MICRO COMPUTER

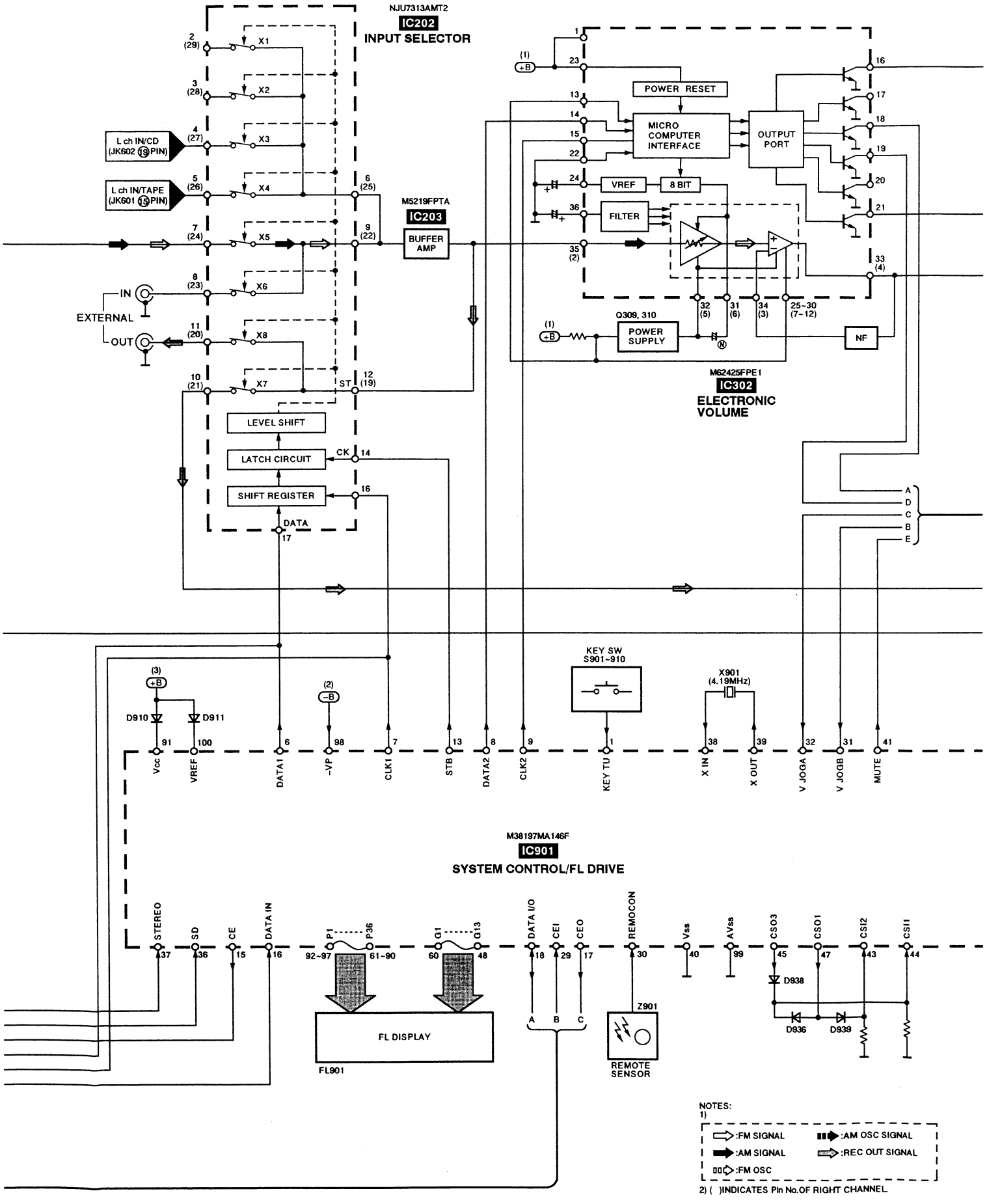
Pin No.	Terminal Name	I/O	Function
1	PB0	–	Not used
2	PB1	–	Not used
3	PB2	–	Not used
4	PB3	–	Not used
5	AV +	–	Not used
6	AV –	–	Not used
7	VSS	–	GND terminal
8	OSC 1	I	Oscillating terminal (f = 4 MHz)
9	OSC 2	O	Oscillating terminal (f = 4 MHz)
10	VDD	I	+ 5 V
11	$\overline{\text{RES}}$	I	Reset signal input
12	TEST	–	Not used
13	R. DATA	I	RDS data signal input
14	R. $\overline{\text{RES}}$	O	RDS data signal output
15	R. CLK	I	RDS clock signal input

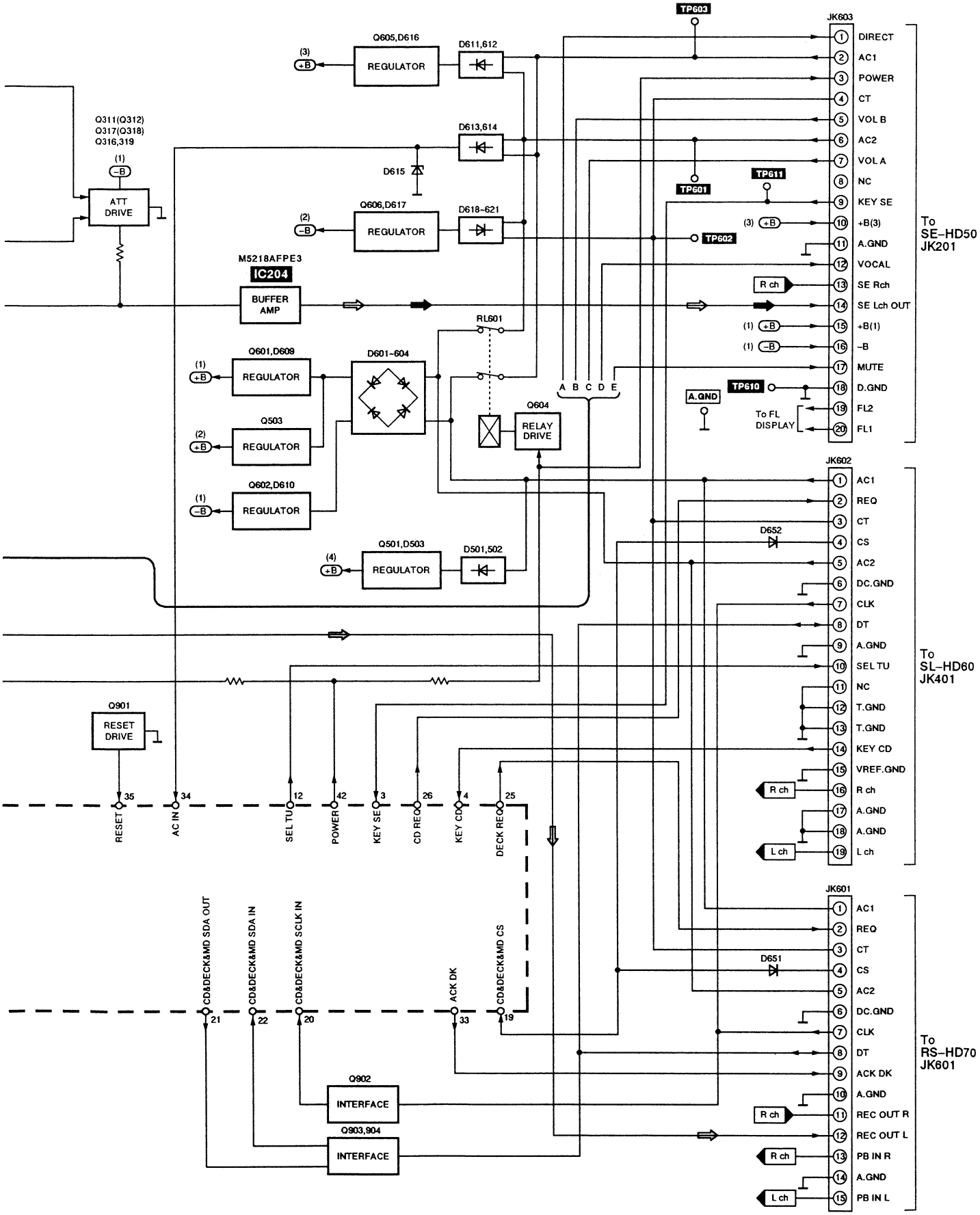
Pin No.	Terminal Name	I/O	Function
16	R. STRT	I	RDS start signal input
17	CEI	I	Serial data input detection terminal
18	CEO	O	Serial data output detection terminal
19	CLK	I/O	Serial clock input/output terminal
20	DATA	I/O	Serial data input/output terminal
21	PD0	–	Not used
22	PD1	–	Not used
23	PD2	–	Not used
24	PD3	–	Not used
25	PE0	–	Not used
26	PE1	–	Not used
27	SSL	–	Not used
28	PA1	–	Not used
29	PA2	–	Not used
30	PA3	–	Not used

■ Block Diagram




STK311-010
IC551
RDS DECODER
X551
(456KHz)
(5)
+B
OSC
PRE AMP
INPUT
BPF
AGC
LPF
ARI-DK DET.
D-PLL
LEVEL DET.
CLOCK RECO-VERY
LOGIC
DIFF DECODE
E-OR
DEF
BI-PHASE DEMOD.
DIV
VCO
IDADJ
DKID
SKID
CORRSEL
AGND
DGND
PARALLEL/ SERIAL CONVERTER
ERROR DETECTOR/ CORRECTION
SERIAL/ PARALLEL CONVERTER
SYNCHRONIZE DETECTOR
SYSTEM CONTROL
OSC
OSC CLK
Vss1
Vss2
Vss3
VDD
Vcc
DATA OUT
CLK OUT
DATA-START
RESET
Q553
SWITCHING
D550
D552
Q551,552
POWER SUPPLY CONTROL
(3)
R.DATA
R.CLK
R.STRT
R.RES
X552
(4MHz)
OSC1
OSC2
LC65104A4F75
IC552
MICRO COMPUTER
/RES
Q550
REST SIGNAL GENERATOR
DATA
CLK
CEO
CEI
Vss
A
B
C
D
E
F


NJU7313AMT2
IC202
INPUT SELECTOR
L ch IN/CD (JK602 19PIN)
L ch IN/TAPE (JK601 15PIN)
IN
EXTERNAL
OUT
X1
X2
X3
X4
X5
X6
X7
X8
ST
LEVEL SHIFT
LATCH CIRCUIT
SHIFT REGISTER
CK
DATA
M5219FPTA
IC203
BUFFER AMP
POWER RESET
MICRO COMPUTER INTERFACE
OUTPUT PORT
VREF
8 BIT
FILTER
Q309, 310
POWER SUPPLY
NF
M62425FPE1
IC302
ELECTRONIC VOLUME
A
D
C
B
E
KEY SW S901~910
X901 (4.19MHz)
D910
D911
Vcc
VREF
DATA1
-VP
CLK1
STB
DATA2
CLK2
KEY TU
X IN
X OUT
V JOGA
V JOGB
MUTE
M38197MA146F
IC901
SYSTEM CONTROL/FL DRIVE
STEREO
SD
CE
DATA IN
P1
P36
G1
G13
DATA I/O
CEI
CEO
REMOCON
Vss
AVss
CSO3
CSO1
CSI2
CSI1
FL DISPLAY
FL901
Z901
REMOTE SENSOR
D938
D936
D939
NOTES:
1)
:FM SIGNAL
:AM SIGNAL
:FM OSC
:AM OSC SIGNAL
:REC OUT SIGNAL
2) ( )INDICATES Pin No.OF RIGHT CHANNEL


TP603
JK603
Q605,D616
D611,612
(3) +B
REGULATOR
DIRECT
AC1
POWER
CT
VOL B
AC2
VOL A
NC
KEY SE
+B(3)
A.GND
VOCAL
SE Rch
SE Lch OUT
+B(1)
-B
MUTE
D.GND
FL2
FL1
To FL DISPLAY
To SE-HD50 JK201
Q311(Q312) Q317(Q318) Q316,319
(1) -B
ATT DRIVE
D613,614
D615
Q606,D617
D618~621
(2) -B
REGULATOR
TP601
TP611
TP602
M5218AFPE3
IC204
BUFFER AMP
RL601
Q601,D609
D601~604
(1) +B
REGULATOR
Q503
(2) +B
REGULATOR
Q602,D610
(1) -B
REGULATOR
Q604
RELAY DRIVE
A B C D E
A.GND
TP610
Q501,D503
D501,502
(4) +B
REGULATOR
JK602
AC1
REQ
CT
CS
AC2
DC.GND
CLK
DT
A.GND
SEL TU
NC
T.GND
T.GND
KEY CD
VREF.GND
R ch
A.GND
A.GND
L ch
D652
To SL-HD60 JK401
Q901
RESET DRIVE
RESET
AC IN
SEL TU
POWER
KEY SE
CD REQ
KEY CD
DECK REQ
JK601
AC1
REQ
CT
CS
AC2
DC.GND
CLK
DT
ACK DK
A.GND
REC OUT R
REC OUT L
PB IN R
A.GND
PB IN L
D651
To RS-HD70 JK601
CD&DECK&MD SDA OUT
CD&DECK&MD SDA IN
CD&DECK&MD SCLK IN
ACK DK
CD&DECK&MD CS
Q902
INTERFACE
Q903,904
INTERFACE

■ Replacement Parts List (Electrical)

Notes: *Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacture's specified parts shown in the parts list.
*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.
*[M] Indicates in Remarks columns parts that are supplied by MESA.

Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)	
IC101	LA1832MH-TEL	IC	[M]
IC102	LC7218M-TE-L	IC	[M]
IC202	NJU7313AMT2	IC	[M]
IC203	M5219FPTA	IC	[M]
IC204	M5218AFPE3	IC	[M]
IC302	M62425FPE1	IC	[M]
IC551	STK311-010	IC	[M]
IC552	LC65104A4F75	IC	[M]
IC901	M38197MA146F	IC	[M]
		TRANSISTOR(S)	
Q101, 102	2SC2787L	TRANSISTOR	[M]
Q103, 104	2SC2785FE	TRANSISTOR	[M]
Q106	UN4111	TRANSISTOR	[M]
Q107, 108	2SC3311AR	TRANSISTOR	[M]
Q110	2SC3311AR	TRANSISTOR	[M]
Q309, 310	2SA1309A-R	TRANSISTOR	[M]
Q311, 312	2SC3311A-Q	TRANSISTOR	[M]
Q316	UN4115	TRANSISTOR	[M]
Q317, 318	2SC3311A-Q	TRANSISTOR	[M]
Q319	UN4115	TRANSISTOR	[M]
Q501⚠	2SC3940AQSTA	TRANSISTOR	[M]
Q503⚠	2SC3940AQSTA	TRANSISTOR	[M]
Q550, 551	UN4211	TRANSISTOR	[M]
Q552	UN411FTA	TRANSISTOR	[M]
Q553	UN4211	TRANSISTOR	[M]
Q601⚠	2SD2137PQTA	TRANSISTOR	[M]
Q602⚠	2SB1417PQTA	TRANSISTOR	[M]
Q604	2SD2144S	TRANSISTOR	[M]
Q605⚠	2SD2137PQTA	TRANSISTOR	[M]
Q606⚠	2SB621A-R	TRANSISTOR	[M]
Q901	UN4214TA	TRANSISTOR	[M]
Q902	DTC143XSTP	TRANSISTOR	[M]
Q903, 904	2SC3311A-Q	TRANSISTOR	[M]
		DIODE(S)	
D101⚠	MA4051MTA	DIODE	[M]
D102	MA165	DIODE	[M]
D301	MA165	DIODE	[M]
D501, 502⚠	MA185TA	DIODE	[M]
D503⚠	MA4150M	DIODE	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
D504⚠	MA4082LTA	DIODE	[M]
D550, 551	MA165	DIODE	[M]
D552	MA723TA	DIODE	[M]
D601-604⚠	RL1N4003N02	DIODE	[M]
D605	MA165	DIODE	[M]
D606, 607	MA719TA	DIODE	[M]
D609, 610⚠	MA4082LTA	DIODE	[M]
D611, 612⚠	RL1N4003N02	DIODE	[M]
D613, 614⚠	MA185TA	DIODE	[M]
D615⚠	MA4051MTA	DIODE	[M]
D616⚠	MA4062-H	DIODE	[M]
D617⚠	MA4300M	DIODE	[M]
D618-621⚠	RL1N4003N02	DIODE	[M]
D622⚠	MA4039MTA	DIODE	[M]
D632	MA165	DIODE	[M]
D651, 652	MA165	DIODE	[M]
D653	MA719TA	DIODE	[M]
D901, 902	MA165	DIODE	[M]
D910	1SS291TA	DIODE	[M]
D911	MA165	DIODE	[M]
D912	1SS291TA	DIODE	[M]
D936	MA165	DIODE	[M]
D938, 939	MA165	DIODE	[M]
D960	MA165	DIODE	[M]
D963, 964	MA165	DIODE	[M]
		COMPONENT COMBINATION(S)	
Z101	RLA2Z002M-T	COMPONENT COMBINATION	[M]
Z102	RL12Z006M-T	COMPONENT COMBINATION	[M]
Z120	RAL0019	FM FRONT END	[M]
Z901	RCDGP1U90XA	REMOTE SENSOR	[M]
		COIL(S)	
L101	ELESNR68MA	COIL	[M]
L103	ELEXTR47MA9	COIL	[M]
L104	ELEXT1R0KA9	COIL	[M]
L105, 106	ELELN822KL	COIL	[M]
L151	SLM1B10M-1M	COIL	[M]
L191	ELESNR68MA	COIL	[M]
L550	ELEXT101KA9	COIL	[M]
L552	ELEXT101KA9	COIL	[M]
L601	ELEXT1R0KA9	COIL	[M]
L901	RLQA100JT-Y	COIL	[M]
L902	ELEXT1R0KA9	COIL	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
		FILTER(S)	
CF201	RLFFETNGD01L	CERAMIC FILTER	[M]
CF202	RLFFETMGD01L	CERAMIC FILTER	[M]
		OSCILLATOR(S)	
X101	RSXZ456KM07M	OSCILLATOR	[M]
X102	RLFDGT05DD	OSCILLATOR	[M]
X103	RSXC7M20S05T	OSCILLATOR	[M]
X551	RSXZ456KM07M	OSCILLATOR	[M]
X552	RVBCST4R00MT	OSCILLATOR	[M]
X901	RSXC4M19S02T	OSCILLATOR	[M]
		DISPLAY TUBE	
FL901	RSL0225-F	DISPLAY TUBE	[M]
		SWITCH(ES)	
S901-910	EVQ21405R	SW	[M]
		CONNECTOR(S)	
CN105	RJU057W007	CONNECTOR(7P)	[M]
CN101A	RJT057W007-1	CONNECTOR(7P)	[M]
CN102A	RJT057W007-1	CONNECTOR(7P)	[M]
CN103A	RJT057W007-1	CONNECTOR(7P)	[M]
CN104A	RJT057W007-1	CONNECTOR(7P)	[M]
CN502A	RJT057W007-1	CONNECTOR(7P)	[M]
CN901A	RJS1A6823	CONNECTOR(23P)	[M]
CN902A	RJS1A6814	CONNECTOR(14P)	[M]
CN904A	RJT066H05A	CONNECTOR(5P)	[M]
CN101B	RJU057W007	CONNECTOR(7P)	[M]
CN102B	RJU057W007	CONNECTOR(7P)	[M]
CN103B	RJU057W007	CONNECTOR(7P)	[M]
CN104B	RJU057W007	CONNECTOR(7P)	[M]
CN502B	RJU057W007	CONNECTOR(7P)	[M]
CN901B	RJS1A6223-1	CONNECTOR(23P)	[M]
CN902B	RJS1A6214-1	CONNECTOR(14P)	[M]
CN904B	RJU066H05	CONNECTOR(5P)	[M]
CP105	RJT057W007-1	CONNECTOR(7P)	[M]
		GND PLATE	
E601, 602	SNE1004-2	GND PLATE	[M]
		RELAY(S)	
RL601/A	RSY0017M-0	RELAY	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
		JACK(S)	
JK101	RJH5210M	ANTENNA TERMINAL	[M]
JK202	SJF3069-5N	EXT OUT/IN	[M]
JK601	RJT065K15	CONNECTOR(15P)	[M]
JK602	RJT065K19	CONNECTOR(19P)	[M]
JK603	RJT065K20	CONNECTOR(20P)	[M]

■ Resistors and Capacitors

Notes: *Capacity values are in microfarads (μF) unless specified otherwise, P = Pico-farads (pF) F = Farads (F)
*Resistance values are in ohms, unless specified otherwise, 1K = 1,000 (OHM) 1M = 1,000k (OHM)
*[M] Indicates in Remarks columns parts that are supplied by MESA.

Ref. No.	Part No.	Values & Remarks
		RESISTORS
R103	ERDS2TJ101	1/4W 100 [M]
R104	ERDS2TJ103	1/4W 10K [M]
R105	ERDS2TJ471	1/4W 470 [M]
R106	ERDS2TJ474	1/4W 470K [M]
R107	ERDS2TJ331	1/4W 330 [M]
R108	ERDS2TJ474	1/4W 470K [M]
R109	ERDS2TJ331	1/4W 330 [M]
R110	ERDS2TJ102	1/4W 1K [M]
R112	ERDS2TJ104	1/4W 100K [M]
R113	ERDS2TJ103	1/4W 10K [M]
R114	ERDS2TJ562	1/4W 5.6K [M]
R115	ERDS2TJ561	1/4W 560 [M]
R116	ERDS2TJ102	1/4W 1K [M]
R117	ERDS2TJ823T	1/4W 82K [M]
R118	ERDS2TJ472	1/4W 4.7K [M]
R119	ERDS2TJ103	1/4W 10K [M]
R120	ERDS2TJ473	1/4W 47K [M]
R121	ERDS2TJ332	1/4W 3.3K [M]
R122	ERDS2TJ272T	1/4W 2.7K [M]
R124	ERDS2TJ271	1/4W 270 [M]
R125, 126	ERDS2TJ152	1/4W 1.5K [M]
R127	ERDS2TJ103	1/4W 10K [M]
R128	ERDS2TJ820	1/4W 82 [M]
R129	ERDS2TJ473	1/4W 47K [M]
R130	ERDS2TJ103	1/4W 10K [M]
R132	ERDS2TJ103	1/4W 10K [M]
R133-137	ERDS2TJ102	1/4W 1K [M]
R138	ERDS2TJ103	1/4W 10K [M]
R139, 140	ERDS2TJ272T	1/4W 2.7K [M]
R141, 142	ERDS2TJ102	1/4W 1K [M]
R143, 144	ERDS2TJ222	1/4W 2.2K [M]
R145, 146	ERDS2TJ821	1/4W 820 [M]
R147, 148	ERDS2TJ474	1/4W 470K [M]
R149	ERDS2TJ680T	1/4W 68 [M]
R171, 172	ERDS2TJ102	1/4W 1K [M]
R173	ERDS2TJ471	1/4W 470 [M]
R175	ERDS2TJ102	1/4W 1K [M]
R176	ERDS2TJ391	1/4W 390 [M]
R177	ERDS2TJ472	1/4W 4.7K [M]
R205, 206	ERDS2TJ224T	1/4W 220K [M]
R207, 208	ERDS2TJ102	1/4W 1K [M]
R209 212	ERDS2TJ822	1/4W 8.2K [M]
R225, 226	ERDS2TJ122	1/4W 1.2K [M]
R229-231	ERDS2TJ222	1/4W 2.2K [M]
R233, 234	ERDS2TJ223	1/4W 22K [M]
R235, 236	ERDS2TJ822	1/4W 8.2K [M]

Ref. No.	Part No.	Values & Remarks
R237, 238	ERDS2TJ123	1/4W 12K [M]
R239-244	ERDS2TJ102	1/4W 1K [M]
R331, 332	ERDS2TJ102	1/4W 1K [M]
R333, 334	ERDS2TJ104	1/4W 100K [M]
R335, 336	ERDS2TJ562	1/4W 5.6K [M]
R337, 338	ERDS2TJ123	1/4W 12K [M]
R339, 340	ERDS2TJ471	1/4W 470 [M]
R341, 342	ERDS2TJ122	1/4W 1.2K [M]
R343, 344	ERDS2TJ224T	1/4W 220K [M]
R345-348	ERDS2TJ103	1/4W 10K [M]
R349, 350	ERDS2TJ102	1/4W 1K [M]
R351	ERDS2TJ182	1/4W 1.8K [M]
R352	ERDS2TJ102	1/4W 1K [M]
R353	ERDS2TJ182	1/4W 1.8K [M]
R354, 355	ERDS2TJ222	1/4W 2.2K [M]
R356-358	ERDS2TJ391	1/4W 390 [M]
R361, 362	ERDS2TJ223	1/4W 22K [M]
R363, 364	ERDS2TJ102	1/4W 1K [M]
R365, 366	ERDS2TJ105T	1/4W 1M [M]
R372	ERDS2TJ105T	1/4W 1M [M]
R374	ERDS2TJ182	1/4W 1.8K [M]
R375, 376	ERDS2TJ102	1/4W 1K [M]
R377, 378	ERDS2EJ121	1/4W 120 [M]
R379, 380	ERDS2TJ223	1/4W 22K [M]
R381	ERDS2TJ105T	1/4W 1M [M]
R382	ERDS2TJ472	1/4W 4.7K [M]
R383	ERDS2TJ223	1/4W 22K [M]
R397, 398	ERQ16NKW2R2E	1W 2.2 [M]
R501	ERDS2TJ152	1/4W 1.5K [M]
R502	ERDS2TJ221	1/4W 220 [M]
R506	ERDS2TJ152	1/4W 1.5K [M]
R507	ERDS2TJ221	1/4W 220 [M]
R508, 509	ERDS2TJ223	1/4W 22K [M]
R511, 512	ERDS2TJ472	1/4W 4.7K [M]
R550	ERDS2TJ472	1/4W 4.7K [M]
R554	ERDS2TJ102	1/4W 1K [M]
R555	ERDS2TJ333	1/4W 33K [M]
R562	ERDS2TJ473	1/4W 47K [M]
R563	ERDS2TJ332	1/4W 3.3K [M]
R565-567	ERDS2TJ332	1/4W 3.3K [M]
R568-571	ERDS2TJ101	1/4W 100 [M]
R576	ERDS2TJ102	1/4W 1K [M]
R601, 602⚠	ERD2FCVJ4R7T	1/4W 4.7 [M]
R603, 604	ERDS2TJ102	1/4W 1K [M]
R605	ERDS2TJ101	1/4W 100 [M]
R606	ERDS2TJ393	1/4W 39K [M]
R607	ERDS2TJ153	1/4W 15K [M]
R609⚠	ERQ16NKW2R2E	1/6W 2.2 [M]
R610	ERDS2TJ222	1/4W 2.2K [M]

Ref. No.	Part No.	Values & Remarks
R612	ERDS2TJ472	1/4W 4.7K [M]
R613, 614	ERDS2TJ682T	1/4W 6.8K [M]
R615	ERDS2TJ103	1/4W 10K [M]
R616⚠	ERD25FVJ4R7T	1/4W 4.7 [M]
R621, 622	ERDS2TJ151	1/4W 150 [M]
R623, 624	ERDS2TJ224T	1/4W 220K [M]
R627-630	ERDS2TJ472	1/4W 4.7K [M]
R631, 632	ERDS2TJ471	1/4W 470 [M]
R635, 636	ERDS2TJ472	1/4W 4.7K [M]
R637, 638	ERDS2TJ150T	1/4W 15 [M]
R641, 642	ERDS2TJ471	1/4W 470 [M]
R656	ERDS2TJ221	1/4W 220 [M]
R901	ERDS2TJ821	1/4W 820 [M]
R902	ERDS2TJ102	1/4W 1K [M]
R903	ERDS2TJ122	1/4W 1.2K [M]
R904	ERDS2TJ152	1/4W 1.5K [M]
R905	ERDS2TJ182	1/4W 1.8K [M]
R906	ERDS2TJ222	1/4W 2.2K [M]
R907	ERDS2TJ332	1/4W 3.3K [M]
R908	ERDS2TJ472	1/4W 4.7K [M]
R909	ERDS2TJ682T	1/4W 6.8K [M]
R911	ERDS2TJ473	1/4W 47K [M]
R916-919	ERDS2TJ103	1/4W 10K [M]
R920-922	ERDS2TJ102	1/4W 1K [M]
R923	ERDS2TJ391	1/4W 390 [M]
R925	ERDS2TJ102	1/4W 1K [M]
R926, 927	ERDS2TJ101	1/4W 100 [M]
R928	ERDS2TJ102	1/4W 1K [M]
R929	ERDS2TJ101	1/4W 100 [M]
R930-933	ERDS2TJ102	1/4W 1K [M]
R934	ERDS2TJ101	1/4W 100 [M]
R935	ERDS2TJ102	1/4W 1K [M]
R936, 937	ERDS2TJ101	1/4W 100 [M]
R938	ERDS2TJ102	1/4W 1K [M]
R939	ERDS2TJ101	1/4W 100 [M]
R940, 941	ERDS2TJ393	1/4W 39K [M]
R942	ERDS2TJ472	1/4W 4.7K [M]
R944	ERDS2TJ473	1/4W 47K [M]
R945, 946	ERDS2TJ102	1/4W 1K [M]
R947-949	ERDS2TJ103	1/4W 10K [M]
R950	ERDS2TJ102	1/4W 1K [M]
R951	ERDS2TJ104	1/4W 100K [M]
R952, 953	ERDS2TJ102	1/4W 1K [M]
R954	ERDS2TJ101	1/4W 100 [M]
R955	ERDS2TJ824	1/4W 820K [M]
R956	ERDS2TJ101	1/4W 100 [M]
R957	ERDS2TJ102	1/4W 1K [M]
R958	ERDS2TJ471	1/4W 470 [M]
R959, 960	ERDS2TJ223	1/4W 22K [M]

Ref. No.	Part No.	Values & Remarks
R961	ERDS2TJ103	1/4W 10K [M]
R962	ERDS2TJ473	1/4W 47K [M]
R963, 964	ERDS2TJ103	1/4W 10K [M]
R965	ERDS2TJ472	1/4W 4.7K [M]
R966	ERDS2TJ223	1/4W 22K [M]
R967	ERDS2TJ472	1/4W 4.7K [M]
R968, 969	ERDS2TJ152	1/4W 1.5K [M]
R970	ERDS2TJ473	1/4W 47K [M]
R971	ERDS2TJ104	1/4W 100K [M]
R978-993	ERDS2TJ104	1/4W 100K [M]
R994	ERDS2TJ102	1/4W 1K [M]
R997 999	ERDS2TJ102	1/4W 1K [M]
		CAPACITORS
C101	ECBT1C103NS5	16V 0.01U [M]
C103	ECBT1C103NS5	16V 0.01U [M]
C104, 105	ECBT1H102KB5	50V 1000P [M]
C106	ECBT1C103NS5	16V 0.01U [M]
C107	ECBT1H473ZF5	50V 0.047U [M]
C108	ECBT1H8R2KC5	50V 8.2P [M]
C109, 110	ECBT1C103NS5	16V 0.01U [M]
C111	ECEA1EKA4R7B	25V 4.7U [M]
C112	ECBT1C103NS5	16V 0.01U [M]
C113	ECBT1H102KB5	50V 1000P [M]
C114	RCE1HKA3R3BG	50V 3.3U [M]
C115	ECEA1EKA4R7B	25V 4.7U [M]
C116	ECBT1C822KS5	16V 8200P [M]
C117	ECQP1391JZ	100V 390P [M]
C118, 119	ECFR1C103KR	16V 0.01U [M]
C120, 121	ECEA1HKA010B	50V 1U [M]
C122	ECEA1HKA2R2B	50V 2.2U [M]
C123	ECEA1HKA010B	50V 1U [M]
C124	ECBT1H102KB5	50V 1000P [M]
C125	ECBT1H150JC5	50V 15P [M]
C126	ECBT1H473ZF5	50V 0.047U [M]
C127	ECEA1CKA220B	16V 22U [M]
C128	ECBT1H102KB5	50V 1000P [M]
C129, 130	ECEA0JKA101B	6.3V 100U [M]
C132	ECBT1H102KB5	50V 1000P [M]
C133, 134	ECBT1H270JU5	50V 27P [M]
C135, 136	ECBT1C103KS5	16V 0.01U [M]
C137, 138	ECBT1H561KB5	50V 560P [M]
C139, 140	ECBT1C682KR5	16V 6800P [M]
C141 144	ECEA1HKA010B	50V 1U [M]
C145	ECBT1H220JC5	50V 22P [M]
C148	ECBT1C103NS5	16V 0.01U [M]
C149	ECBT1H104ZF5	50V 0.1U [M]
C171, 172	ECBT1H102KB5	50V 1000P [M]
C173	ECEA1CKA220B	16V 22U [M]
C174	RCE1CKA100BG	16V 10U [M]
C181	ECBT1H471KB5	50V 470P [M]

Ref. No.	Part No.	Values & Remarks
C196	ECBT1H102KB5	50V 1000P [M]
C205-208	ECBT1H101KB5	50V 100P [M]
C209, 210	ECBT1H180J5	50V 18P [M]
C211	ECBT1H102KB5	50V 1000P [M]
C223, 224	ECBT1H104ZF5	50V 0.1U [M]
C225-227	ECBT1H470J5	50V 47P [M]
C231, 232	ECBT1E103ZF	25V 0.01U [M]
C233, 234	ECBT1H102KB5	50V 1000P [M]
C235, 236	ECBT1H101KB5	50V 100P [M]
C237, 238	ECBT1H470J5	50V 47P [M]
C321, 322	ECBT1E103ZF	25V 0.01U [M]
C323, 324	ECBT1H102KB5	50V 1000P [M]
C325, 326	ECBT1H101KB5	50V 100P [M]
C327, 328	RCE1AKA470BG	10V 47U [M]
C333, 334	ECBT1H221KB5	50V 220P [M]
C335, 336	RCE1CKA100BG	16V 10U [M]
C337, 338	ECEA1CKA220B	16V 22U [M]
C339, 340	RCE1CKA100BG	16V 10U [M]
C341, 342	ECEA1AKN100B	10V 10U [M]
C343	RCE1CKA100BG	16V 10U [M]
C344, 345	ECBT1H470J5	50V 47P [M]
C348	ECEA1CKA330B	16V 33U [M]
C350	ECEA0JKA470B	6.3V 47U [M]
C351, 352	RCE1CKA100BG	16 V 10U [M]
C355	ECEA1CKA330B	16V 33U [M]
C356	ECBT1H104ZF5	50V 0.1U [M]
C357	RCE1AKA101BG	10V 100U [M]
C365	ECEA0JKA470B	6.3V 47U [M]
C391, 392	ECEA1CKA101B	16V 100U [M]
C393, 394	ECBT1H102KB5	50V 1000P [M]
C501	ECEA1EKA101B	25V 100U [M]
C502	ECA1VM101B	35V 100U [M]
C503	ECBT1E103ZF	25V 0.01U [M]
C504	ECEA1EKA101B	25V 100U [M]
C509	ECBT1E103ZF	25V 0.01U [M]
C510	RCE1AKA101BG	10V 100U [M]
C513-515	ECBT1H102KB5	50V 1000P [M]
C550, 551	ECA0JKF101B	6.3V 100U [M]
C557	ECBT1H102KB5	50V 1000P [M]
C558	ECEA0JKA101B	6.3V 100U [M]
C559, 560	ECEA1HKA010B	50V 1U [M]
C570	ECBT1H102KB5	50V 1000P [M]
C601, 602	ECKT1H223ZF	50V 0.022U [M]
C603⚠	ECA1EM102B	25V 1000U [M]
C604⚠	RCE1EM471BV	25V 470U [M]
C605, 606	ECBT1E103ZF	25V 0.01U [M]
C607, 608	RCE1AKA470BG	10V 47U [M]
C609	ECBT1H102KB5	50V 1000P [M]
C610, 611	ECBT1H104ZF5	50V 0.1U [M]
C612	RCE1EM471BV	25V 470U [M]
C613	ECBT1E103ZF	25V 0.01U [M]
C614	RCE1AKA470BG	10V 47U [M]

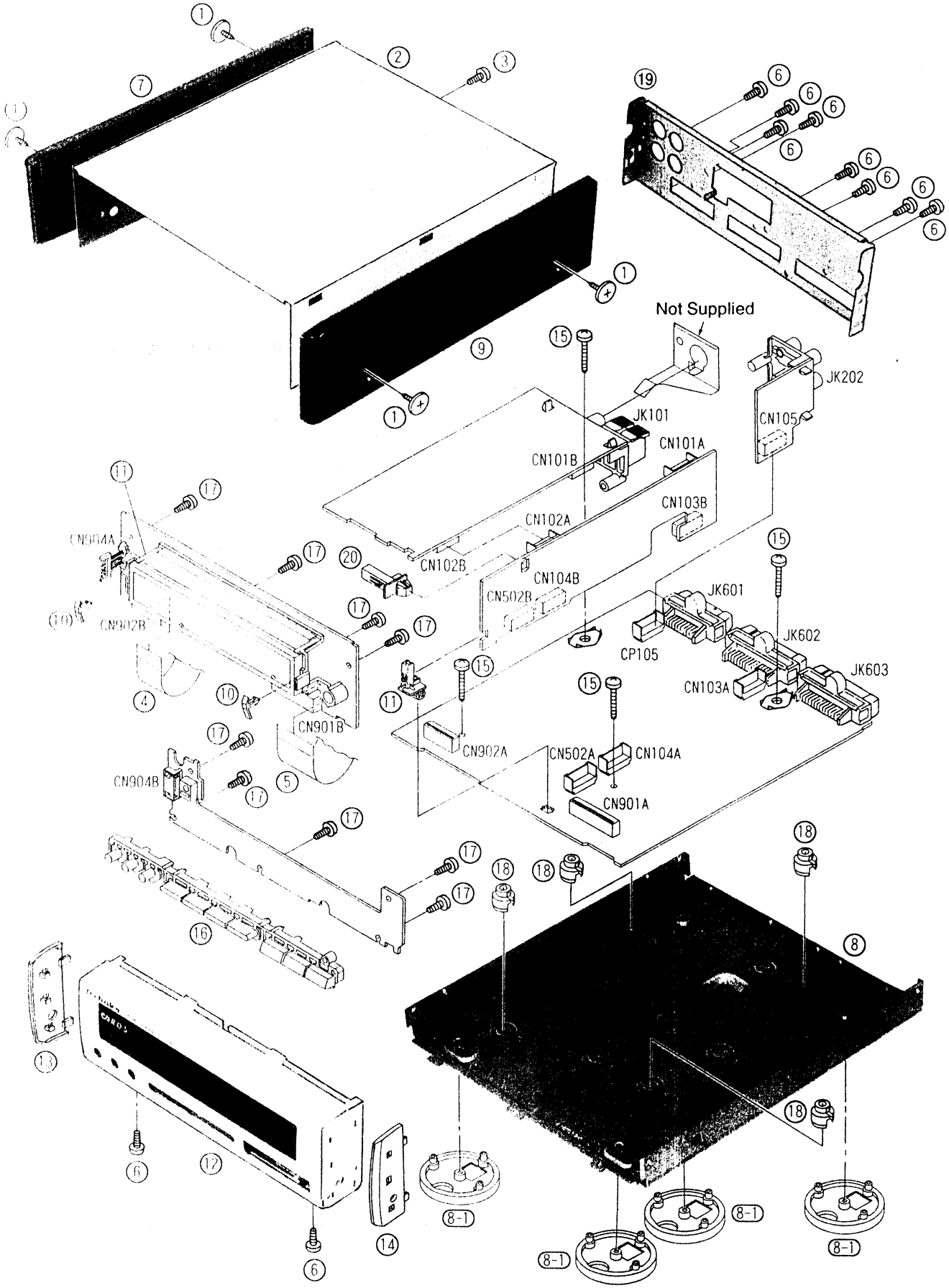
Ref. No.	Part No.	Values & Remarks
C615	ECEA1EKA101B	25V 100U [M]
C616	ECA1HM470B	50V 47U [M]
C617⚠	ECA1HM470B	50V 47U [M]
C618⚠	ECA2AM470B	100V 47U [M]
C619	ECKR1H103ZF5	50V 0.01U [M]
C620	RCE1VKA100BG	35V 10U [M]
C623	RCE1AKA101BG	10V 100U [M]
C624	ECEA1VKA470B	35V 47U [M]
C631-636	ECBT1H101KB5	50V 100P [M]
C651, 652	ECBT1H104ZF5	50V 0.1U [M]
C655	ECQV1H224JM3	50V 0.22U [M]
C656	ECQV1H474JM3	50V 0.47U [M]
C901-904	ECBT1H471KB5	50V 470P [M]
C905, 906	ECBT1H102KB5	50V 1000P [M]
C907	ECBT1H104ZF5	50V 0.1U [M]
C908	ECBT1E103ZF	25V 0.01U [M]
C909	ECEA1HKA2R2B	50V 2.2U [M]
C910	RCE1CKA100BG	16V 10U [M]
C911	ECBT1H270JU5	50V 27P [M]
C912	ECBT1H220GC5	50V 22P [M]
C913	ECEA1VKA470B	35V 47U [M]
C915	ECBT1E103ZF	25V 0.01U [M]
C916, 917	ECEA1HKA010B	50V 1U [M]
C918	ECBT1C105ZF5	16V 1U [M]
C919	RCE0JU102BV	6.3V 1000U [M]
C920	ECBT1E103ZF	25V 0.01U [M]
C922	ECEA0JKA221B	6.3V 220U [M]
C923	ECBT1H101KB5	50V 100P [M]
C924	ECBT1H102KB5	50V 1000P [M]
C954-957	ECBT1H101KB5	50V 100P [M]

■ Replacement Prats List (Cabinet)

Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET PARTS	
1	RHD30073-K	SCREW	[M]
2	RKM0327-S	CABINET	[M]
3	XTB3+8JFZ	SCREW	[M]
4	REZ0883	FFC(14P)	[M]
5	REZ0944	FFC(21P)	[M]
6	XTBS3+8JFZ1	SCREW	[M]
7	RGK0817-M	SIDE PANEL(L)·1	[M]
8	RFKJTHD7-N	CHASSIS ASS'Y	[M]
8-1	RKA0076-N	FOOT	[M]
9	RGK0818-M	SIDE PANEL(R)·1	[M]
10	RMN0195	STOPPER	[M]
11	RMN0381	FL HOLDER	[M]
12	RFKGTHD60EN	FRONT PANEL ASS'Y	[M]
13	RGK0819-N	SIDE PANEL(L)·2	[M]
14	RGK0820-N	SIDE PANEL(R)·2	[M]
15	XTB3+12JFZ	SCREW	[M]
16	RGU1394A-S	BUTTON, OPERATION	[M]
17	XTBS26+8J	SCREW	[M]
18	SHE170-2	SPACER	[M]
19	RGR0242B-D	REAR PANEL	[M]
20	RMN0203	HOLDER	[M]

Ref. No.	Part No.	Part Name & Description	Remarks

■ Cabinet Parts Location



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F970207500KH/HY

ORDER NO. AD9706090S

Service Manual

Supplement

Tuner

Tuner

ST-HD60

Please file and use this supplement manual together with the service manual for Model No. ST-HD60, Order No. AD9702016C2.

Note: This supplement is intended to provide additional information or corrections to the existing service manual for model No.ST-HD60. Be sure to update your service manual for future reference.

Colour

(N).....Gold Type

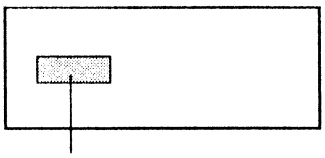
Areas

(E)/(EP) .....Europe, Russia.

CHANGE

■ RDS circuit has been changed for improvement in performance.
With the change of RDS circuit, FL circuit system control IC (IC901) has also been changed.

■ A set with changed RDS circuit can be distinguished as follows:
Please check the Serial No. entered on the back side of a set.



Location of Serial No.

○○○○B○○○○○

If the letter in this position in B or alphabetically after B.

Example : FR7B**B**13003

⚠WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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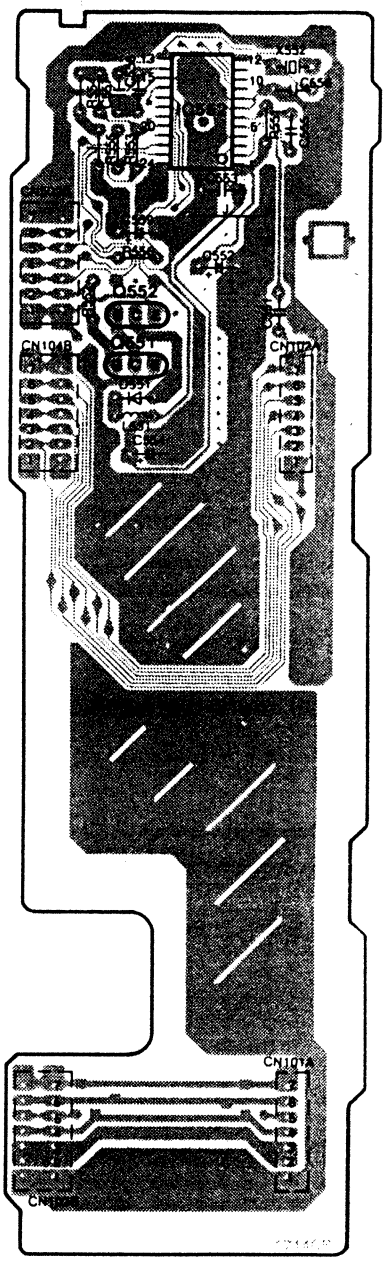
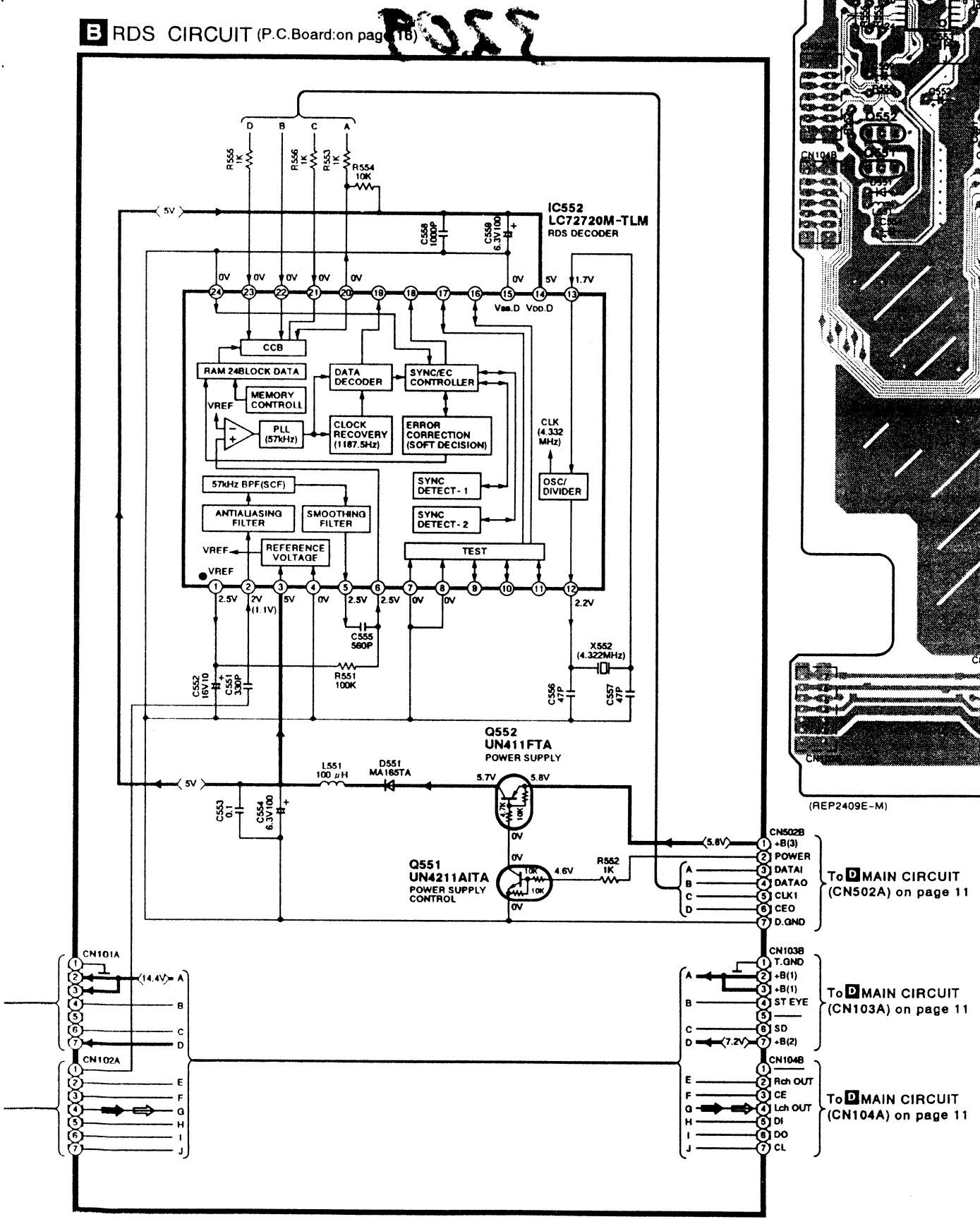
■ Schematic Diagram and Printed Circuit Board Diagram

B RDS P.C.B.



(REP2409E-M)

B RDS CIRCUIT (P.C.Board:on page 18)



■ Replacement Parts List

Note: *[M] Indicates in Remarks columns parts that are supplied by MESA.

● For RDS Circuit

Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)	
IC552	LC72720M TLM	IC	[M]
		TRANSISTOR(S)	
Q551	UN4211	TRANSISTOR	[M]
Q552	UN411FTA	TRANSISTOR	[M]
		DIODE(S)	
D551	MA165	DIODE	[M]
		COIL(S)	
L551	ELEXT101KA9	COIL	[M]
		OSCILLATOR(S)	
X552	RSXC4M33S02T	OSCILLATOR	[M]
		CONNECTOR(S)	
CN101A	RJT057W007-1	CONNECTOR(7P)	[M]
CN102A	RJT057W007-1	CONNECTOR(7P)	[M]
CN103B	RJU057W007	CONNECTOR(7P)	[M]
CN104B	RJU057W007	CONNECTOR(7P)	[M]
CN502B	RJU057W007	CONNECTOR(7P)	[M]

Ref. No.	Part No.	Values & Remarks
		RESISTORS
R551	ERDS2FJ104	1/4W 100K [M]
R552, 553	ERDS2FJ102	1/4W 1K [M]
R554	ERDS2FJ103	1/4W 10K [M]
R555, 556	ERDS2FJ102	1/4W 1K [M]
		CAPACITORS
C551	ECBT1H331KB5	50V 330P [M]
C552	RCE1CKA100BG	16V 10U [M]
C553	ECBT1H1042F5	50V 0.1U [M]
C554	ECA0JKF101B	6.3V 100U [M]
C555	ECBT1H561KB5	50V 560P [M]
C556, 557	ECBT1H470J5	50V 47P [M]
C558	ECBT1H102KB5	50V 1000P [M]
C559	ECA0JKF101B	6.3V 100U [M]

● For FL Circuit

Ref. No.	Change of Parts No.		Part Name & Description	Remarks
	Original	➡ **Supplement**		
INTEGRATED CIRCUIT				
IC901	M38197MA146F	**M38197MA180F**	IC	[M]

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F970604500HS/YI
70206T003